
Integrated Services Network

Meridian SL-1*

QCA144 1.5 MB/S Remote Peripheral
Equipment Cabinet

Publication number: Appendix 1 to 553-2601-200

Document Status: Standard

Date: 88 06 10

Description, Installation and Testing

© 1987 Northern Telecom

All rights reserved.

* Meridian and SL-1 are trademarks of Northern Telecom Limited

Contents

1. Description	1-1
Remote Peripheral Equipment (RPE)	1-1
QCA144 RPE cabinet	1-1
Expansion shelves	1-1
Power converters	1-2
Power line cords	1-2
Reserve batteries	1-3
Cooling units	1-3
Built-in cross connect terminal	1-3
 2 Installation and connections	 2-1
Environment	2-1
Grounding	2-1
Option and switch settings on circuit packs	2-1
Installation	
 Figure	
1-1 Front View QCA144 RPE Cabinet	1-4
1-2 Front View Typical Common Equipment (CE) Cabinet	1-5
2-1 Ground Connection and Tests	2-5
2-2 Typical Terminal Block Layout	2-6
2-3 Built-in Cross Connect Terminal layout	2-7
2-4 RPE Cables C and D Cross Connections	2-8
2-5 Front View of RPE Cabinet	2-9
2-6 Shelf Assembly	2-21
2-7 Rear View of Cabinet	2-22
2-8 Battery Cell Connections	2-28

Contents Continued

2-9	Reserve Power Supply Connections	2-29
2-10	Expansion Battery Unit Connections	2-30
2-11	P10 Cable Terminations and Designations	2-35
2-12	Cabinet Top Assembly	2-38
2-13	Cooling Unit Location and Connections	2-39
2-14	QBL15 Battery Distribution Box	2-45
2-15	Reserve Power Connections Outside Cabinet	2-46
2-16	Battery Sensing and Monitoring Connections	2-47
2-17	Local-To-Remote Cross-Connections	2-48

Charts

2-1	QCA144 RPE Cabinet Installation	2-4
2-2	QSD66 or QSD69 Expansion Shelf Installation	2-17
2-3	QBL24 Battery Unit Installation (Main Unit)	2-23
2-4	Expansion QBL24 Battery Unit Installation	2-26
2-5	QUA6 Power Fail Transfer Unit (PFTU) Installation	2-31
2-6	Alarm and Transfer Wiring (P10) Installation	2-32
2-7	QPC705 Power Converter Installation	2-36
2-8	QUD24 Fan Unit Installation	2-37
2-9	QCAD321 Junction Box Assembly Installation	2-40
2-10	QBL15 Battery Distribution Box Installation	2-44

Tables

2-A	Peripheral Equipment Cable Terminating Sequence	2-15
2-B	PFJ1 Emergency Transfer Cable Cross-connections	2-34
2-C	Cable C Designations (Receive) Local and Remote	2-49
2-D	Cable D Designations (Transmit) Local and Remote	2-50

Reason For Reissue: This Practice is reissued to include additional information about cross-connections, to remove references to rectifiers other than the QRF12 -48 V rectifier supplied with the system and to make other minor changes. Changes are indicated by a vertical bar in the margin next to the affected item.

1. Description

Remote peripheral equipment (RPE)

1.01 A description of the use and operation of RPE is given in 553-2601-200.

1.02 This appendix describes the installation, connections and testing of RPE installed in a QCA144 RPE cabinet and in a QSD69 RPE shelf mounted in a cabinet either at the remote end or the local end.

QCA144 RPE cabinet

1.03 The QCA144 RPE cabinet is used to house RPE equipment at a remote location. The single-tier base cabinet is equipped with an RPE shelf, one PE shelf capable of accommodating ten PE line packs and a peripheral buffer circuit pack, and the required power equipment (Fig. 1-1). The base cabinet can be expanded to a two- or three-tier cabinet by the addition of one RPE or two PE expansion shelves. An RPE shelf can be installed in place of a PE expansion shelf if additional network loops are required.

Expansion shelves

1.04 QSD69 RPE shelf. The QSD69 RPE shelf assembly can be mounted at the Main Meridian SL-1 location in a QCA136 or QCA141 CE equipment cabinet (Fig. 1-2) or in a QCA144 RPE cabinet at the remote location. The RPE shelf assembly is designed to contain all the RPE related circuit packs required to operate two network loops. Included in the shelf assembly is a dual loop PE shelf containing eight slots for lines and trunks. One additional slot is reserved for a dual loop peripheral buffer circuit pack.

1.05 QSD66 PE expansion shelf. The QSD66 PE expansion shelf can be used to expand a QCA144 RPE cabinet to a two- or three-tier cabinet. The QSD66 is equipped with two PE shelves each capable of accommodating eight line circuit packs and one peripheral buffer circuit pack.

Note: Although the QSD66 PE expansion shelf provides dual-loop capabilities, the shelf can only be used in a single-loop mode when operating with RPE.

Power converters

1.06 QPC705 Power Converter. The QPC705 power converter supplies ± 15 V (for SL-1 and digital telephones) and -150 V (for message waiting) to the PE shelf in the first tier of the cabinet. A QCAD278 cable is required to connect the QPC705 converter.

1.07 QPC706 Power Converter. The QPC706 power converter provides all the required power supplies to each PE shelf in the second and third tiers of the cabinet. One converter is required for each PE shelf and is installed in the designated slot on each shelf.

Power line cords

1.08 Three commercial power line cords can be used with the QCA144 RPE cabinet.

- (a) A QCAD273 line cord is used when a 115 V 15A power supply is provided. A NEMA type 5-15R power supply receptacle is required to accommodate the line cord.
- (b) A QCAD274 line cord is used when a 220 V 20A power supply is provided. A NEMA type L6-20R power supply receptacle is required to accommodate the line cord.
- (c) A QCAD275 line cord is used when a 110 V 30A power supply is provided. A NEMA type L5-30R power supply receptacle is required to accommodate the line cord.

1.09 Power cords are connected to the rear of the -48 V rectifier in the cabinet.

Reserve batteries

1.10 One or two QBL24 battery units containing rechargeable dry cells can be connected to the cabinet when service is required during commercial power failures.

1.11 The cabinet can also be connected to lead acid batteries through a QBL15 battery distribution box and a QCAD321 junction box assembly.

Cooling units

1.12 QUD24 Cooling Units are used to dissipate excess heat and are required in cabinets equipped with three tiers.

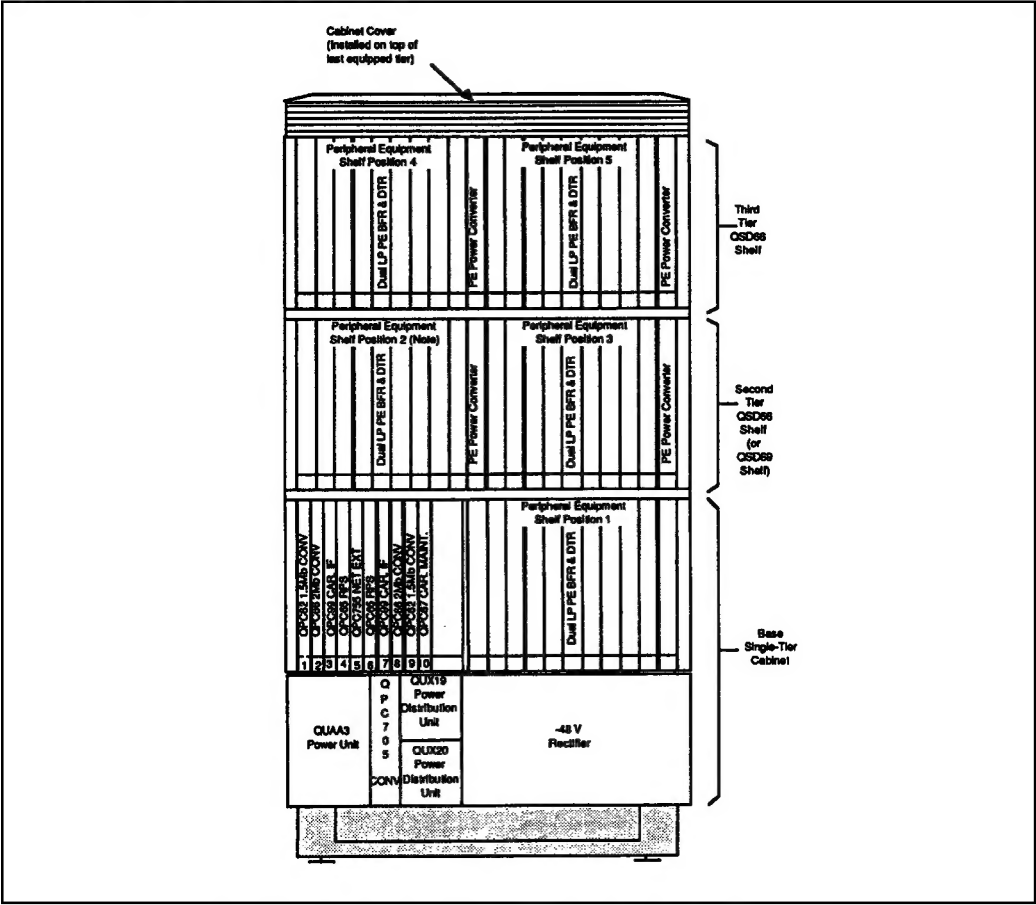
Built-in cross connect terminal

1.13 An optional built-in cross connect terminal using BIX* cable terminal block system is available with cabinets equipped for suppression of EMI. The built-in cross connect terminal, which is mounted on the EMI shields at the rear of the cabinet, is accessible through the removal of the cabinet rear covers. Connections to the system which would otherwise be made at an external wall mounted or frame mounted terminal can be made using the built-in cross connect terminal.

1.14 In a three tier cabinet the built-in cross connect terminal allows for 424 three-pair station wiring terminations plus additional connectors for Power Fail Transfer Unit (PFTU) terminations. However, in cases where a high density of 16-port line cards and/or four- or six-pair station cabling is used, there may not be sufficient space to route or terminate all the wiring. In these cases, additional external terminal blocks may be required. The built-in cross connect terminal feature is not used in two cabinet configurations.

* BIX is a trademark of Northern Telecom

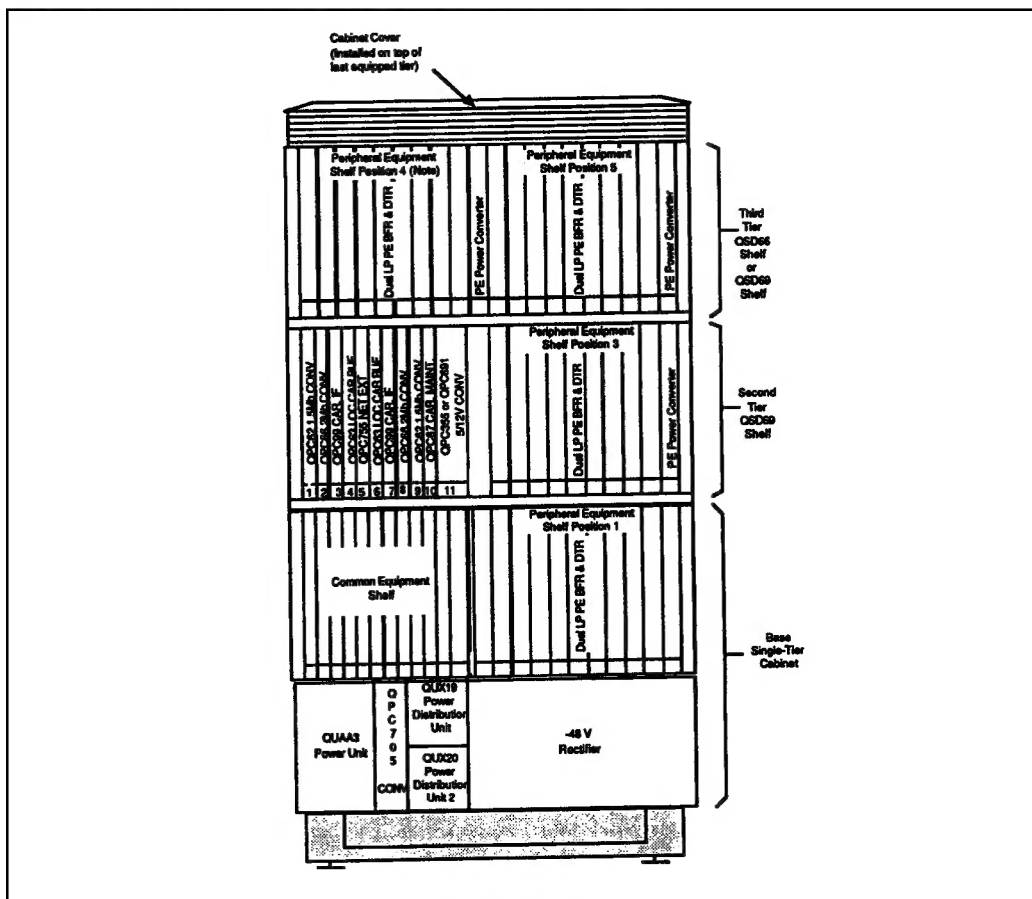
Figure 1-1
Front View QCA144 RPE Cabinet



Note: This position can be equipped with an RPE shelf when additional RPE network loops are required.

(III.553-1266)

Figure 1-2
Front View Typical Common Equipment (CE) Cabinet



Note: This position can be equipped with a QSD69 RPE shelf when additional RPE network loops are required.

(III.553-1267)

2. Installation and connections

Environment

2.01 The QCA144 should be installed in an environment suitable for Meridian SL-1. The location should be clean, dry and protected from extreme heat or cold. The operating environment described in 553-2YY1-200 for the location of the main Meridian SL-1 should be used as a guide when installing the QCA144 RPE cabinet.

Grounding

2.02 The QCA144 cabinet must be connected to a suitable building ground to ensure proper operation of the RPE equipment. Refer to 553-2YY1-200 for a description of suitable building grounds.

| Option and switch settings on circuit packs

2.03 Certain circuit packs are equipped with option plugs or switches located on the component side of the pack. Refer to 553-2201-211 for a list of these circuit packs and the option settings.

Caution: Incorrectly set option plugs or switches on circuit packs can prevent the system from operating properly and in certain cases can cause system failure. Check option settings on all circuit packs being installed in the cabinet.

Installation

2.04 Chart 2-1 describes the steps which should be followed when installing a QCA144 RPE cabinet.

2.05 Chart 2-2 describes the procedures which should be followed when installing an additional QSD66 PE or QSD69 RPE shelf assembly in an existing QCA144 RPE cabinet.

2.06 Chart 2-3 describes the procedures which should be followed when installing a QBL24 Battery Unit.

2.07 Chart 2-4 describes the procedures which should be followed when installing an expansion QBL24 Battery Unit.

2.08 Chart 2-5 describes the procedures which should be followed when installing a QUA6 Power Fail Transfer Unit (PFTU).

2.09 Chart 2-6 describes the procedures which should be followed when installing alarm and transfer wiring (P10).

2.10 Chart 2-7 describes the procedures which should be followed when installing a QPC705 power converter.

2.11 Chart 2-8 describes the procedures which should be followed when installing QUD24 cooling units.

2.12 Chart 2-9 describes the procedures which should be followed when installing a QCAD321 junction box assembly.

2.13 Chart 2-10 describes the procedures which should be followed when installing QBL15 battery distribution box.

Chart 2-1**QCA RPE CABINET INSTALLATION**

STEP	PROCEDURE
1	Transport the cabinet as close as possible to its final location.
2	Transport the remaining equipment to a convenient safe dry location.
3	Unpack and inspect the cabinet.
4	Remove cabinet from pallet and place on floor.
5	If casters are provided, tilt the cabinet and replace the levellers on the cabinet with four casters.
6	Adjust floor levellers or casters when in final location. When casters are provided, ensure that they are locked in position when the cabinet is in its final location.
7	Remove the front and rear cabinet covers.
8	If required, install additional shelves as described in Chart 2-2.
9	Install but do not connect a 6 AWG wire between the approved building ground and the ground lug identified by a ground symbol (Fig. 2-1) at the rear of the cabinet.
10	At the building ground end of the wire, connect the 6 AWG wire to the approved building using at least two fastening devices and insulate the connections with electrical tape. Install a DO NOT DISCONNECT tag on the connection.
11	With an ohmmeter, measure the resistance between the ground pin on the ac power cord plug and the ground lug at the rear of the cabinet (Fig. 2-1). The resistance should be 0 Ω . If greater than 0 Ω , check power cord connections at rear of cabinet.
12	Ensure that the AC BRKR breaker on the faceplate of the -48 V rectifier in the cabinet is set to OFF.
13	Connect the power line cord to the commercial ac power supply.
14	Measure the resistance between the system ground wire and the ground lug at the rear of the cabinet (Fig. 2-1). If the resistance is greater than 5 Ω , check the building ground and ac panel connections.
15	Disconnect the power line cord from the commercial ac power supply.
16	Connect the 6 AWG building ground wire to the ground lug identified by a ground symbol at the rear of the cabinet (Fig. 2-1).

Chart Continued

Chart 2-1 Continued

QCA RPE CABINET INSTALLATION

STEP PROCEDURE

- 17 If required, install reserve battery unit as described in Chart 2-3.
- 18 If cabinet is not equipped with a built-in cross connect terminal, install connecting blocks at cross-connect terminal. A typical wall-mounted terminal block layout is shown in Fig. 2-2.
- 19 If a QUA6 Power Fail Transfer Unit (PFTU) is provided, install unit as described in Chart 2-4.
- 20 If required, install alarm and transfer (P10) wiring as described in Chart 2-5.
- 21 Install and terminate Peripheral Equipment (PE) cables to cross connect terminal. Cable terminating sequence is given in Table 2-A.

Note: These cables are usually factory installed in cabinets equipped with a built-in cross connect terminal (Fig. 2-3).

- 22 Install and terminate two NE A-25B-type cables from connectors C and D at the rear of the RPE shelf to connecting blocks at an external crossconnect terminal. See Tables 2-C and 2-D cable color terminating sequence and lead designations.

Note: Do not terminate RPE cables C and D on the built-in cross connect terminal.

- 23 Install cross connections for RPE cables C and D as shown in Fig. 2-4, Fig. 2-17 and in Part 6 of 553-2601-200.
 - 24 Ensure that the circuit packs are in their assigned position in the RPE shelf (Fig. 2-5).
 - 25 Connect ac power line cord to commercial ac power supply.
 - 26 Set all breakers at the front of the cabinet to ON.
 - 27 Test RPE equipment as described in 553-2601-200.
 - 28 Install front and rear covers on cabinet.
-

Figure 2-1
Ground Connection and Tests

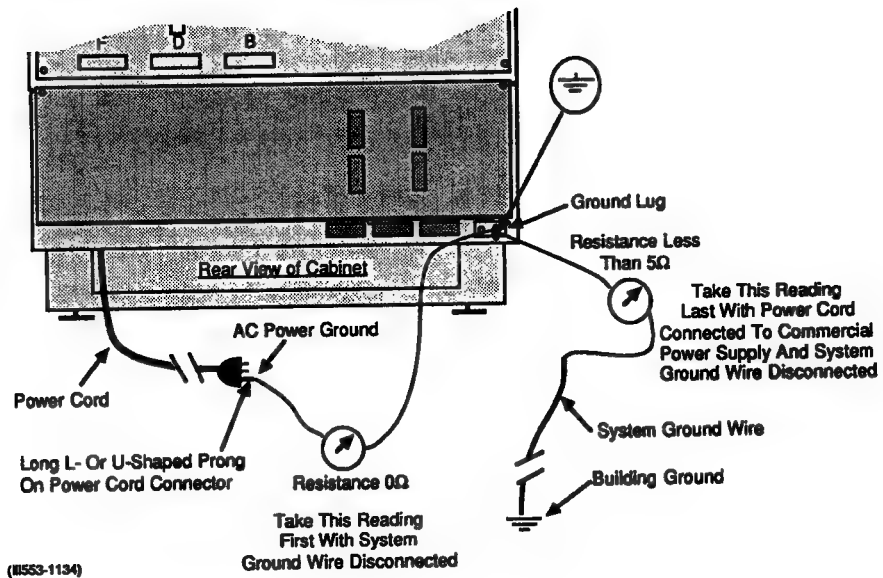


Figure 2-2
Typical Terminal Block Layout

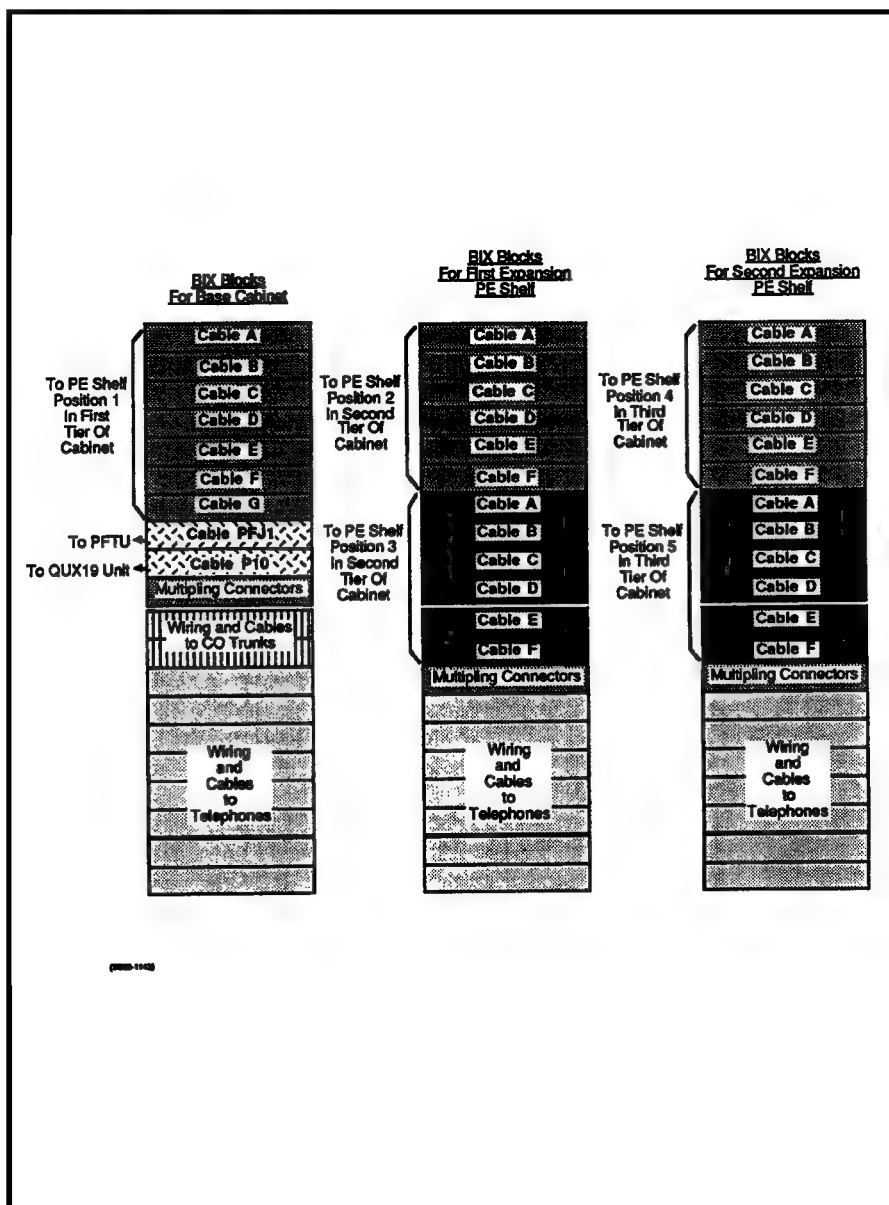


Figure 2-3
Built-in Cross Connect Terminal Layout

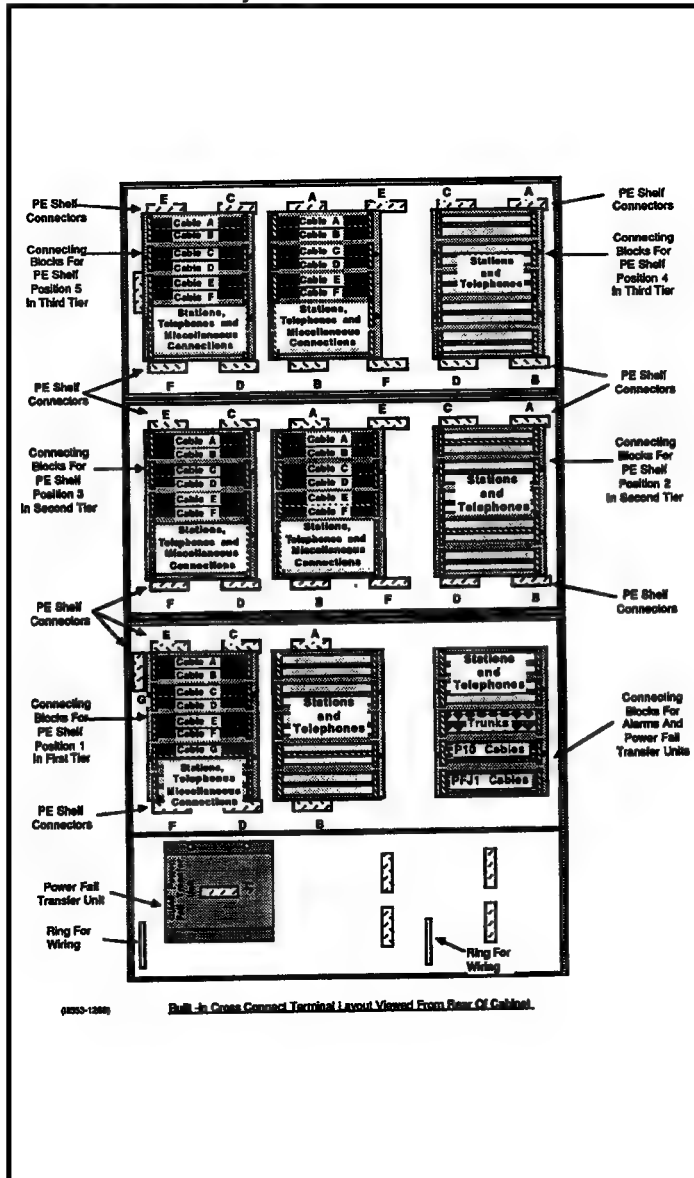


Figure 2-4
RPE Cables C and D Cross Connections

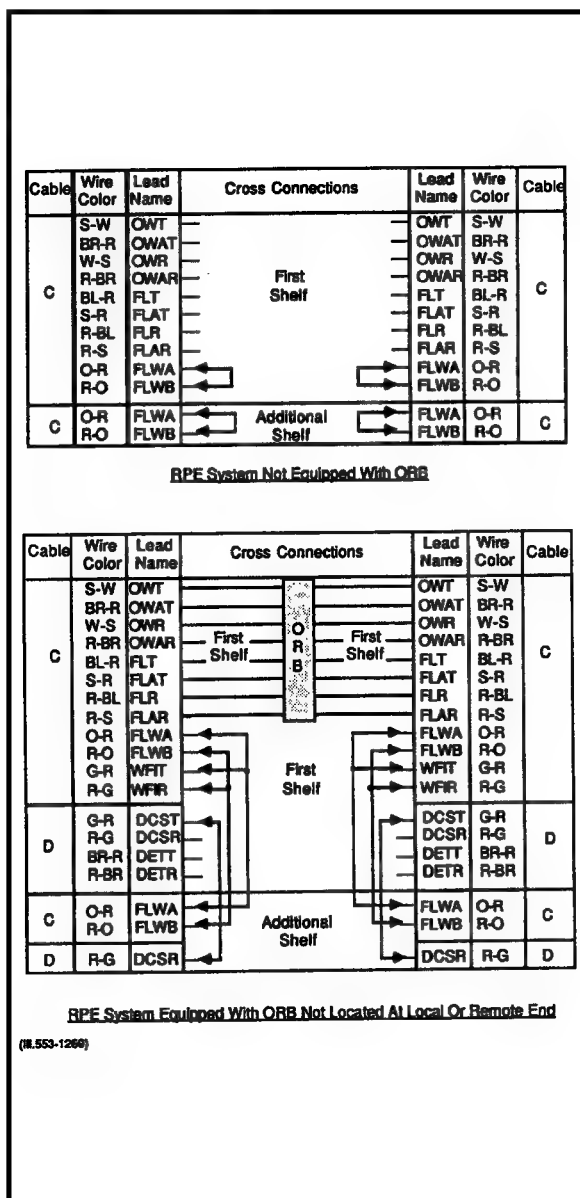


Figure 2-5
Front View of RPE Cabinet

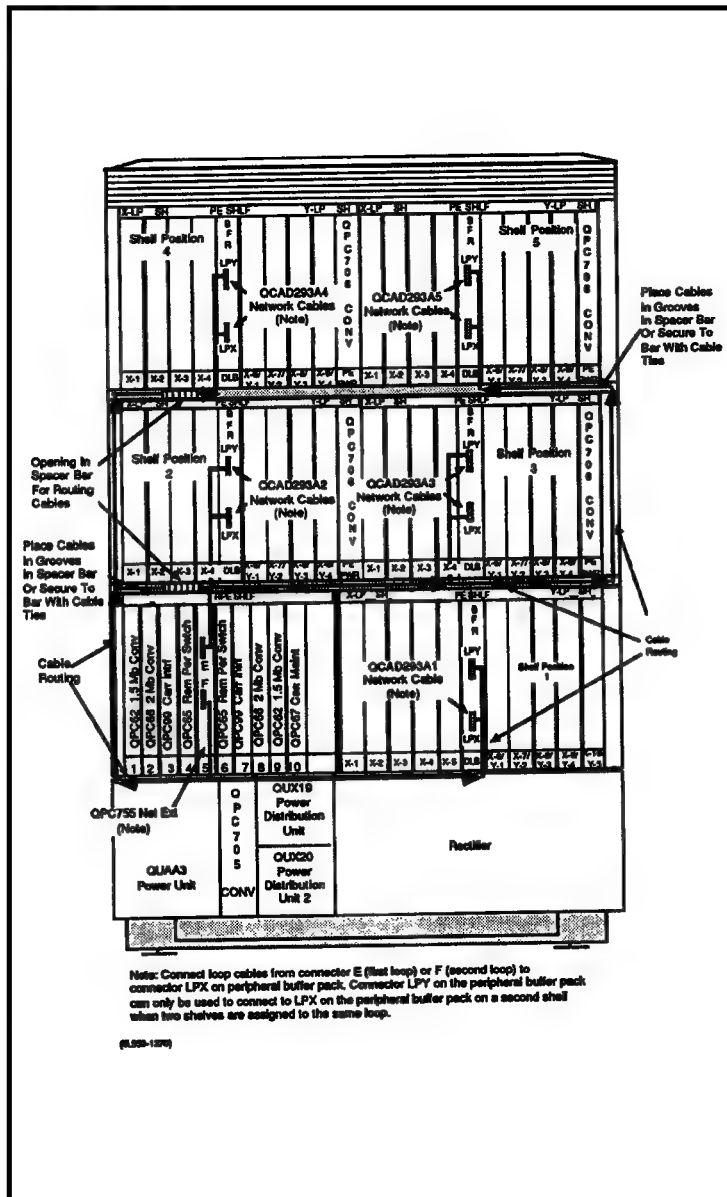


Table 2-A

PERIPHERAL EQUIPMENT CABLE TERMINATING SEQUENCE

PER CABLE FROM CONNECTOR A										
			TERMINAL NUMBER (TN)							
PAIR	PN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD		
1T	26	W-BL	S L O T X-1 C A R D 1	S L O T X-1 C A R D 1	UNIT 0	UNIT 0	UNIT 0	UNIT 0		
1R	1	BL-W			UNIT 0					
2T	27	W-O			UNIT 8					
2R	2	O-W			UNIT 1					
3T	28	W-G			UNIT 9	UNIT 1	UNIT 1	UNIT 1		
3R	3	G-W			UNIT 2					
4T	29	W-BR			UNIT 10	UNIT 2				
4R	4	BR-W			UNIT 3					
5T	30	W-S			UNIT 11	UNIT 3	UNIT 1	UNIT 1		
5R	5	S-W			UNIT 4					
6T	31	R-BL			UNIT 12	UNIT 4				
6R	6	BL-R			UNIT 13					
7T	32	R-O			UNIT 14	UNIT 5	UNIT 2			
7R	7	O-R			UNIT 15					
8T	33	R-G			UNIT 6	UNIT 6				
8R	8	G-R			UNIT 7					
9T	34	R-BR			UNIT 8	UNIT 7	UNIT 3			
9R	9	BR-R			UNIT 9					
10T	35	R-S			UNIT 10	UNIT 8				
10R	10	S-R			UNIT 11					
11T	36	BK-BL	S L O T X-2 C A R D 2	S L O T X-2 C A R D 2	UNIT 0	UNIT 0	UNIT 0	UNIT 0		
11R	11	BL-BK			UNIT 9					
12T	37	BK-O			UNIT 1	UNIT 1				
12R	12	O-BK			UNIT 2					
13T	38	BK-G			UNIT 3	UNIT 1	UNIT 1	UNIT 1		
13R	13	G-BK			UNIT 4					
14T	39	BK-BR			UNIT 5	UNIT 2				
14R	14	BR-BK			UNIT 6					
15T	40	BK-S			UNIT 7	UNIT 3	UNIT 2			
15R	15	S-BK			UNIT 8					
16T	41	Y-BL			UNIT 9	UNIT 4				
16R	16	BL-Y			UNIT 10					
17T	42	Y-O			UNIT 11	UNIT 5	UNIT 3			
17R	17	O-Y			UNIT 12					
18T	43	Y-G			UNIT 13	UNIT 6				
18R	18	G-Y			UNIT 14					
19T	44	Y-BR			UNIT 15	UNIT 7	UNIT 4			
19R	19	BR-Y			UNIT 16					
20T	45	Y-S			UNIT 17	UNIT 8				
20R	20	S-Y			UNIT 18					
21T	46	V-BL	S L O T X-3 C A R D 3	S L O T X-3 C A R D 3	UNIT 0	UNIT 0	UNIT 0	UNIT 0		
21R	21	BL-V			UNIT 9					
22T	47	V-O			UNIT 1	UNIT 1				
22R	22	O-V			UNIT 2					
23T	48	V-G			UNIT 3	UNIT 2	UNIT 1	UNIT 1		
23R	23	G-V			UNIT 4					
24T	49	V-BR			UNIT 5	UNIT 3				
24R	24	BR-V			UNIT 11					
25R	50	V-S			SPARE					
25T	25	S-V								

(BESS-11464)

(8553-1146a)

Table 2-A Continued

PERIPHERAL EQUIPMENT CABLE TERMINATING SEQUENCE

PE CABLE FROM CONNECTOR B									
			TERMINAL NUMBER (TN)						
PAIR	FIN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD	
1T	26	W-BL	S L O T	S L O T	UNIT 4	UNIT 4	UNIT 2		
1R	1	BL-W			UNIT 4				
2T	27	W-O			UNIT 12				
2R	2	O-W	X-2	X-2	UNIT 5	UNIT 5			
3T	28	W-G			UNIT 13				
3R	3	G-W			UNIT 13				
4T	29	W-BR	C A R D	C A R D	UNIT 6	UNIT 6	UNIT 3		
4R	4	BR-W			UNIT 14				
5T	30	W-S			UNIT 7				
5R	6	S-W	2	2	UNIT 15	UNIT 7			
6T	31	R-BL			UNIT 0				
6R	6	BL-R			UNIT 8				
7T	32	R-O	2	2	UNIT 1	UNIT 1	UNIT 0	UNIT 0	
7R	7	O-R			UNIT 9				
8T	33	R-G			UNIT 2				
8R	8	G-R			UNIT 15	UNIT 7			
9T	34	R-BR			UNIT 0				
9R	9	BR-R			UNIT 0				
10T	35	R-S			UNIT 8	UNIT 0	UNIT 0	UNIT 0	
10R	10	S-R			UNIT 8				
11T	36	BK-BL			UNIT 1				
11R	11	BL-BK	S L O T	S L O T	UNIT 1	UNIT 1	UNIT 1	UNIT 1	
12T	37	BK-O			UNIT 2				
12R	12	O-BK			UNIT 2				
13T	38	BK-G	S L O T	S L O T	UNIT 2	UNIT 2	UNIT 1	UNIT 1	
13R	13	G-BK			UNIT 10				
14T	39	BK-BR			UNIT 10				
14R	14	BR-BK	X-3	X-3	UNIT 11	UNIT 3	UNIT 1	UNIT 1	
15T	40	BK-S			UNIT 3				
15R	15	S-BK			UNIT 3				
16T	41	Y-BL	C A R D	C A R D	UNIT 11	UNIT 4	UNIT 2	UNIT 2	
16R	16	BL-Y			UNIT 11				
17T	42	Y-O			UNIT 4				
17R	17	O-Y	3	3	UNIT 5	UNIT 4	UNIT 2	UNIT 2	
18T	43	Y-G			UNIT 5				
18R	18	G-Y			UNIT 12				
19T	44	Y-BR	3	3	UNIT 13	UNIT 5	UNIT 3	UNIT 3	
19R	19	BR-Y			UNIT 5				
20T	45	Y-S			UNIT 13				
20R	20	S-Y	X-3	X-3	UNIT 6	UNIT 6	UNIT 3	UNIT 3	
21T	46	V-BL			UNIT 6				
21R	21	BL-V			UNIT 14				
22T	47	V-O	C A R D	C A R D	UNIT 7	UNIT 7	UNIT 7	UNIT 7	
22R	22	O-V			UNIT 7				
23T	48	V-G			UNIT 15				
23R	23	G-V			UNIT 7	UNIT 7	UNIT 7	UNIT 7	
24T	49	V-BR			UNIT 15				
24R	24	BR-V			UNIT 15				
25R	50	V-S	SPARE						
25T	25	S-V							

(553-1148b)

Table 2-A Continued

PERIPHERAL EQUIPMENT CABLE TERMINATING SEQUENCE

PE CABLE FROM CONNECTOR C									
			TERMINAL NUMBER (TN)						
PAIR	PN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD	
1T	26	W-BL			UNIT 0	UNIT 0	UNIT 0	UNIT 0	
1R	1	BL-W			UNIT 0				
2T	27	W-O			UNIT 0				
2R	2	O-W			UNIT 0				
3T	28	W-G			UNIT 1	UNIT 1	UNIT 1	UNIT 1	
3R	3	G-W			UNIT 1				
4T	29	W-BR			UNIT 1				
4R	4	BR-W			UNIT 1				
5T	30	W-S	S L O T	S L O T	UNIT 2	UNIT 2	UNIT 1	UNIT 1	
5R	5	S-W			UNIT 2				
6T	31	R-BL			UNIT 2				
6R	6	BL-R			UNIT 2				
7T	32	R-O	X-4	X-4	UNIT 3	UNIT 3	UNIT 2		
7R	7	O-R			UNIT 3				
8T	33	R-G			UNIT 3				
8R	8	G-R			UNIT 3				
9T	34	R-BR	C A R D	C A R D	UNIT 4	UNIT 4	UNIT 2		
9R	9	BR-R			UNIT 4				
10T	35	R-S			UNIT 4				
10R	10	S-R			UNIT 4				
11T	36	BK-BL	4	4	UNIT 5	UNIT 5	UNIT 2		
11R	11	BL-BK			UNIT 5				
12T	37	BK-O			UNIT 5				
12R	12	O-BK			UNIT 5				
13T	38	BK-G			UNIT 6	UNIT 6	UNIT 3		
13R	13	G-BK			UNIT 6				
14T	39	BK-BR			UNIT 6				
14R	14	BR-BK			UNIT 6				
15T	40	BK-S			UNIT 7	UNIT 7	UNIT 3		
15R	15	S-BK			UNIT 7				
16T	41	Y-BL			UNIT 15				
16R	16	BL-Y			UNIT 15				
17T	42	Y-O	S L O T	S L O T	UNIT 0	UNIT 0	UNIT 0	UNIT 0	
17R	17	O-Y			UNIT 0				
18T	43	Y-G			UNIT 0				
18R	18	G-Y			UNIT 0				
19T	44	Y-BR	X-5	X-5	UNIT 1	UNIT 1	UNIT 0		
19R	19	BR-Y			UNIT 1				
20T	45	Y-S			UNIT 1				
20R	20	S-Y			UNIT 1				
21T	46	V-BL	C A R D	C A R D	UNIT 2	UNIT 2	UNIT 1	UNIT 1	
21R	21	BL-V			UNIT 2				
22T	47	V-O			UNIT 2				
22R	22	O-V			UNIT 2				
23T	48	V-G	S L O T	S L O T	UNIT 3	UNIT 3	UNIT 1	UNIT 1	
23R	23	G-V			UNIT 3				
24T	49	V-BR			UNIT 3				
24R	24	BR-V			UNIT 3				
25R	50	V-S	SPARE						
25T	25	S-V							

Notes:
1. Card number 5 (slot 5 in PE shelf) cannot be assigned on shelves equipped with only eight PE slots.
2. The transfer lead (BR-V) is provided only on PE shelves equipped with a maximum of eight slots and connects to the PE SHELF TRANSFER lead (W-O) of the QUAS power fail transfer unit serving trunks on this shelf (if equipped).

(R553-1148c)

Table 2-A Continued

PERIPHERAL EQUIPMENT CABLE TERMINATING SEQUENCE

PE CABLE FROM CONNECTOR ID													
			TERMINAL NUMBER (TN)										
PAIR	PN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD					
1T	26	W-BL	S L O T	S L O T	UNIT 4	UNIT 4	UNIT 2						
1R	1	BL-W			UNIT 12								
2T	27	W-O			UNIT 5								
2R	2	O-W			UNIT 13								
3T	28	W-G	X-5	X-5	UNIT 13	UNIT 5							
3R	3	G-W			UNIT 6								
4T	29	W-BR			UNIT 14								
4R	4	BR-W			UNIT 7								
5T	30	W-S	C A R D	C A R D	UNIT 8	UNIT 6	UNIT 3						
5R	5	S-W			UNIT 15								
6T	31	R-BL			UNIT 7								
6R	6	BL-R			UNIT 15								
7T	32	R-O	5	5	UNIT 7	UNIT 7							
7R	7	O-R											
8T	33	R-G											
8R	8	G-R			(Note)								
9T	34	R-BR			UNIT 0	UNIT 0	UNIT 0	UNIT 0					
9R	9	BR-R			UNIT 8								
10T	35	R-S			UNIT 1								
10R	10	S-R			UNIT 0								
11T	36	BK-BL			UNIT 1	UNIT 1							
11R	11	BL-BK			UNIT 0								
12T	37	BK-O			UNIT 2								
12R	12	O-BK			UNIT 10								
13T	38	BK-G	S L O T	S L O T	UNIT 2	UNIT 2	UNIT 1	UNIT 1					
13R	13	G-BK			UNIT 3								
14T	39	BK-BR			UNIT 11								
14R	14	BR-BK			UNIT 4								
15T	40	BK-S	Y-1	X-6	UNIT 3	UNIT 3							
15R	15	S-BK			UNIT 11								
16T	41	Y-BL			UNIT 4								
16R	16	BL-Y			UNIT 12								
17T	42	Y-O	C A R D	C A R D	UNIT 4	UNIT 4	UNIT 2						
17R	17	O-Y			UNIT 13								
18T	43	Y-G			UNIT 5								
18R	18	G-Y			UNIT 13								
19T	44	Y-BR	1	5	UNIT 6	UNIT 5							
19R	19	BR-Y			UNIT 6								
20T	45	Y-S			UNIT 13								
20R	20	S-Y			UNIT 6								
21T	46	V-BL			UNIT 6	UNIT 6	UNIT 3						
21R	21	BL-V			UNIT 14								
22T	47	V-O			UNIT 7								
22R	22	O-V			UNIT 15								
23T	48	V-G			UNIT 7	UNIT 7							
23R	23	G-V											
24T	49	V-BR											
24R	24	BR-V											
25R	50	V-S	SPARE										
25T	25	S-V											

Note: Card number 5 (slot 5 in PE shell) cannot be assigned on shelves equipped with only eight PE slots.

(B953-1146d)

Note: Card number 5 (slot 5 in PE shell) cannot be assigned on shelves equipped with only eight PE slots.
(B553-1146d)

Table 2-A Continued

PERIPHERAL EQUIPMENT CABLE TERMINATING SEQUENCE

PE CABLE FROM CONNECTOR E								
			TERMINAL NUMBER (TN)					
PAIR	PIN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD
1T	26	W-BL			UNIT 0	UNIT 0	UNIT 0	UNIT 0
1R	1	BL-W			UNIT 8			
2T	27	W-O			UNIT 1	UNIT 1		
2R	2	O-W			UNIT 9			
3T	28	W-G			UNIT 2	UNIT 2	UNIT 1	UNIT 1
3R	3	G-W			UNIT 10			
4T	29	W-BR			UNIT 3	UNIT 3		
4R	4	BR-W			UNIT 11			
5T	30	W-S	S L O T	S L O T	UNIT 4	UNIT 4	UNIT 2	UNIT 2
5R	5	S-W			UNIT 12			
6T	31	R-BL			UNIT 5	UNIT 5		
6R	6	BL-R			UNIT 13			
7T	32	R-O	Y-2	X-7	UNIT 6	UNIT 6	UNIT 3	UNIT 3
7R	7	O-R			UNIT 14			
8T	33	R-G			UNIT 7	UNIT 7		
8R	8	G-R			UNIT 15			
9T	34	R-BR	C A R D	C A R D	UNIT 8	UNIT 8	UNIT 0	UNIT 0
9R	9	BR-R			UNIT 16			
10T	35	R-S			UNIT 9	UNIT 9		
10R	10	S-R			UNIT 17			
11T	36	BR-BL	2	7	UNIT 10	UNIT 10	UNIT 1	UNIT 1
11R	11	BL-BK			UNIT 18			
12T	37	BK-O			UNIT 11	UNIT 11		
12R	12	O-BK			UNIT 19			
13T	38	BK-G			UNIT 12	UNIT 12	UNIT 2	UNIT 2
13R	13	G-BK			UNIT 20			
14T	39	BK-BR			UNIT 13	UNIT 13		
14R	14	BR-BK			UNIT 21			
15T	40	BK-S			UNIT 14	UNIT 14	UNIT 3	UNIT 3
15R	15	S-BK			UNIT 22			
16T	41	Y-BL			UNIT 15	UNIT 15		
16R	16	BL-Y			UNIT 23			
17T	42	Y-O	S L O T	S L O T	UNIT 16	UNIT 16	UNIT 4	UNIT 4
17R	17	O-Y			UNIT 24			
18T	43	Y-G			UNIT 17	UNIT 17		
18R	18	G-Y			UNIT 25			
19T	44	Y-BR	Y-3	X-8	UNIT 18	UNIT 18	UNIT 5	UNIT 5
19R	19	BR-Y			UNIT 26			
20T	45	Y-S			UNIT 19	UNIT 19		
20R	20	S-Y			UNIT 27			
21T	46	V-BL	C A R D	C A R D	UNIT 20	UNIT 20	UNIT 6	UNIT 6
21R	21	BL-V			UNIT 28			
22T	47	V-O			UNIT 21	UNIT 21		
22R	22	O-V			UNIT 29			
23T	48	V-G	3	8	UNIT 22	UNIT 22	UNIT 7	UNIT 7
23R	23	G-V			UNIT 30			
24T	49	V-BR			UNIT 23	UNIT 23		
24R	24	BR-V			UNIT 31			
25R	50	V-S	SPARE					
25T	25	S-V						

Table 2-A Continued

PERIPHERAL EQUIPMENT CABLE TERMINATING SEQUENCE

PE CABLE FROM CONNECTOR F									
TERMINAL NUMBER (TN)									
PAIR	PIN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD	4 UNITS PER CARD	2 UNITS PER CARD	
1T	26	W-BL	S L O T	S L O T	UNIT 4	UNIT 4	UNIT 2		
1R	1	BL-W			UNIT 12				
2T	27	W-O			UNIT 5	UNIT 5			
2R	2	O-W			UNIT 13				
3T	28	W-G	Y-3	X-8	UNIT 6	UNIT 6	UNIT 3		
3R	3	G-W			UNIT 14				
4T	29	W-BR			UNIT 7	UNIT 7			
4R	4	BR-W			UNIT 15				
5T	30	W-S	C A R D	C A R D	UNIT 0	UNIT 0	UNIT 0		
5R	5	S-W			UNIT 8				
6T	31	R-BL			UNIT 1	UNIT 1			
6R	6	BL-R			UNIT 9				
7T	32	R-O	S L O T	S L O T	UNIT 2	UNIT 2	UNIT 1		
7R	7	O-R			UNIT 10				
8T	33	R-G			UNIT 3	UNIT 3			
8R	8	G-R			UNIT 11				
9T	34	R-BR	Y-4	X-9	UNIT 4	UNIT 4	UNIT 2		
9R	9	BR-R			UNIT 12				
10T	35	R-S			UNIT 5	UNIT 5			
10R	10	S-R			UNIT 13				
11T	36	BK-BL	S L O T	S L O T	UNIT 6	UNIT 6	UNIT 3		
11R	11	BL-BK			UNIT 14				
12T	37	BK-O			UNIT 7	UNIT 7			
12R	12	O-BK			UNIT 9				
13T	38	BK-G	Y-3	X-8	UNIT 0	UNIT 0	UNIT 0		
13R	13	G-BK			UNIT 8				
14T	39	BK-BR			UNIT 1	UNIT 1			
14R	14	BR-BK			UNIT 9				
15T	40	BK-S	C A R D	C A R D	UNIT 2	UNIT 2	UNIT 1		
15R	15	S-BK			UNIT 10				
16T	41	Y-BL			UNIT 3	UNIT 3			
16R	16	BL-Y			UNIT 11				
17T	42	Y-O	4	9	UNIT 4	UNIT 4	UNIT 2		
17R	17	O-Y			UNIT 12				
18T	43	Y-G			UNIT 5	UNIT 5			
18R	18	G-Y			UNIT 13				
19T	44	Y-BR	S L O T		S L O T	UNIT 6		UNIT 6	UNIT 3
19R	19	BR-Y				UNIT 14			
20T	45	Y-S		UNIT 7		UNIT 7			
20R	20	S-Y		UNIT 15					
21T	46	V-BL	C A R D	C A R D	UNIT 0	UNIT 0	UNIT 0		
21R	21	BL-V			UNIT 8				
22T	47	V-O			UNIT 1	UNIT 1			
22R	22	O-V			UNIT 9				
23T	48	V-G	4	9	UNIT 2	UNIT 2	UNIT 1		
23R	23	G-V			UNIT 10				
24T	49	V-BR			UNIT 3	UNIT 3			
24R	24	BR-V			UNIT 11				
25R	50	V-S			SPARE				
25T	25	S-V							

7800L1148A

18055-11-000

Table 2-A Continued

PERIPHERAL EQUIPMENT CABLE TERMINATING SEQUENCE

PE CABLE FROM CONNECTOR G						
TERMINAL NUMBER (TN)						
PAIR	PN	PAIR COLOR	DUAL LOOP MODE	SINGLE LOOP MODE	16 UNITS PER CARD	8 UNITS PER CARD
1T	26	W-BL	S L O T	S L O T	UNIT 0	UNIT 0
1R	1	BL-W			UNIT 0	
2T	27	W-O			UNIT 8	
2R	2	O-W			UNIT 1	
3T	28	W-G			UNIT 9	UNIT 1
3R	3	G-W			UNIT 2	
4T	29	W-BR			UNIT 10	
4R	4	BR-W			UNIT 3	
5T	30	W-S			UNIT 11	UNIT 2
5R	5	S-W			UNIT 4	
6T	31	R-BL	Y-5	X-10	UNIT 12	UNIT 3
6R	6	BL-R			UNIT 5	
7T	32	R-O			UNIT 6	
7R	7	O-R			UNIT 13	
8T	33	R-G			UNIT 14	UNIT 4
8R	8	G-R			UNIT 7	
9T	34	R-BR			UNIT 15	
9R	9	BR-R			UNIT 8	
10T	35	R-S			UNIT 16	UNIT 5
10R	10	S-R			UNIT 9	
11T	36	BK-BL	5	10	UNIT 17	UNIT 6
11R	11	BL-BK			UNIT 10	
12T	37	BK-O			UNIT 18	
12R	12	O-BK			UNIT 11	
13T	38	BK-G			UNIT 19	UNIT 7
13R	13	G-BK			UNIT 12	
14T	39	BK-BR			UNIT 20	
14R	14	BR-BK			UNIT 13	
15T	40	BK-S			UNIT 21	UNIT 8
15R	15	S-BK			UNIT 14	
16T	41	Y-BL	C A R D	C A R D	UNIT 22	
16R	16	BL-Y			UNIT 15	
17T	42	Y-O			UNIT 23	UNIT 9
17R	17	O-Y			UNIT 16	
18T	43	Y-G			UNIT 24	
18R	18	G-Y			UNIT 17	
19T	44	Y-BR			UNIT 25	UNIT 10
19R	19	BR-Y			UNIT 18	
20T	45	Y-S			UNIT 26	
20R	20	S-Y			UNIT 19	
21T	46	V-BL	S P A R E	S P A R E	UNIT 27	UNIT 11
21R	21	BL-V			UNIT 20	
22T	47	V-O			UNIT 28	
22R	22	O-V			UNIT 21	
23T	48	V-G			UNIT 29	UNIT 12
23R	23	G-V			UNIT 22	
24T	49	V-BR			UNIT 30	
24R	24	BR-V			UNIT 23	
25R	50	V-S			UNIT 31	UNIT 13
25T	25	S-V			UNIT 24	

Note: Slot 10 applies only to PE shelves equipped with 10 PE slots.

/B553-1146a

Chart 2-2**QSD66 OR QSD69 EXPANSION SHELF INSTALLATION****STEP PROCEDURE**

- 1 Remove screws securing front and rear cabinet covers and remove covers.
- 2 If the cabinet is equipped with EMI shields, set the CAB INP breaker on the QUX19 to OFF.
- 3 Set the input breakers on the QUX20 unit (if equipped) for the new shelf to OFF.

Note: The designations on the breakers located on the QUX20 unit correspond to connectors PE2 through PE5 on the QCAD276 and QCAD277 power cables.

- 4 Perform this step only if the cabinet is equipped with EMI shields.
Tag and disconnect cables from connectors at rear of cabinet to allow removal of EMI shields. Remove screws securing shields and remove shields.
- 5 If not previously installed, install a QUX20 power unit as follows:
 - Insert the QUX20 unit in its position in front of cabinet (Fig. 2-5) and secure with two mounting screws.
 - From the rear of the cabinet, connect lead equipped with a spade connector from the QUX20 unit to the terminal at TB3 at rear of the QUX19 unit
- 6 Remove the louvered top assembly from the cabinet by removing the six screws through the top assembly.
- 7 Remove the side panels from each end of the existing top shelf of the cabinet by sliding panels upward (Fig. 2-6).
- 8 Remove the four hex screws at each end of the top shelf securing the top panel to the cabinet (Fig. 2-6).
- 9 Remove top panel and place towards rear of cabinet. Do not damage wiring to the thermostat in top panel.
- 10 With self-tapping screws supplied, secure a joiner plate (two screws each) to each end of the existing top shelf of the cabinet.
- 11 Ensure that the spacers installed in the top of each of the two front corner uprights of the cabinet are in place (Fig. 2-6).

Chart Continued

Chart 2-2 Continued

QSD66 OR QSD69 EXPANSION SHELF INSTALLATION

STEP PROCEDURE

- 12 Reinstall the two cabinet side panels by sliding them down in the grooves located in the uprights at each end of the cabinet. The flange on the side panels should be positioned at the top facing towards the inside of the cabinet.
- 13 Set the new shelf on top of the existing shelf with both ends overlapping the joiner plates.
- 14 Install a spacer between the bottom front rail of the new shelf and the top front rail of the existing top shelf as follows (Fig. 2-6):
 - Tilt the new shelf slightly backwards.
 - Position the spacer bar with the cut-out on the left and facing outward (Fig. 2-6) in the groove along the top front of the existing shelf.
 - Lower the new shelf onto the spacer bar with the top rail of the bar in the groove in the bottom of the new shelf.
- 15 Align the new shelf with the existing shelf and secure the joiner plates with two screws each.
- 16 If equipped, remove EMI shield from shelf.
- 17 Connect power connector from QCAD276 or QCAD277 power cable to connector J on the shelf backplane according to shelf position in the cabinet (Fig. 2-7).
 - Connector PE2 from QCAD276 cable connects to backplane in position 2.
 - Connector PE3 from QCAD276 cable connects to backplane in position 3.
 - Connector PE4 from QCAD277 cable connects to backplane in position 4.
 - Connector PE5 from QCAD277 cable connects to backplane in position 5.
- 18 If not previously connected, connect the other end of the power cable as follows:
 - a) QCAD276 power cable.
 - Connector P3 to J3 at the rear of the QUAA3 power unit.
 - Black leads equipped with ring connections to the GRD2 lug on the ground bus near the rear of the QUAA3 unit.

Chart Continued

Chart 2-2 Continued**QSD66 OR QSD69 EXPANSION SHELF INSTALLATION****STEP PROCEDURE**

- White leads equipped with ring connections to the GRD1 lug on the ground bus.
 - The red lead designated 2 equipped with a spade connector to TB5 terminal 2 at the rear of the QUX20 unit.
 - The blue lead designated 3 equipped with a spade connector to TB5 terminal 3 at the rear of the QUX20 unit.
- b) QCAD277 power cable.
- Connector P4 to J4 at the rear of the QUAA3 power unit.
 - Connector P7 to J7 at the rear of the QUAA3 power unit.
 - Black leads equipped with ring connections to the GRD2 lug on the ground bus near the rear of the QUAA3 unit.
 - White leads equipped with ring connections to the GRD1 lug on the ground bus.
 - The red lead designated 4 equipped with a spade connector to TB5 terminal 4 at the rear of the QUX20 unit.
 - The blue lead designated 5 equipped with a spade connector to TB5 terminal 5 at the rear of the QUX20 unit.

19 Reinstall top panel and secure to top shelf with four hex screws at each end.

20 Install the two shelf side panels by sliding them down into the grooves located in the uprights at each end of the new shelf.

Note: The flange on the side panels should be positioned at the top facing towards the inside of the new cabinet.

21 If QUD24 cooling units are required, install units as described in Chart 2-8.
If cooling units are not required, reinstall the louvered top assembly on top of the new shelf and secure with six screws through the top.

22 If previously removed, reinstall EMI shields and reconnect cables.

23 If required, install EMI shield on new shelf and secure with mounting screws.

Chart Continued

Chart 2-2 Continued

QSD66 OR QSD69 EXPANSION SHELF INSTALLATION

STEP PROCEDURE

- 24 If this is an operating cabinet, set the CAB INP breaker on the QUX19 unit to ON to restore service to the cabinet.
- 25 Install circuit packs in assigned positions in new shelf (Fig. 2-5).
- 26 If cabinet is not equipped with a built-in cross connect terminal (Fig. 2-3), install NE-A25B-type cables from connectors A, B, C, D, E and F on the shelf backplane to the cross connect terminal. Cable terminating sequence is shown in Table 2-A.
- 27 Set the input breakers for the new shelf to ON.

Note: The designations on the QUX20 power unit correspond to connectors PE2 through PE5 on the QCAD276 and QCAD277 power cables.

Figure 2-6
Shelf Assembly

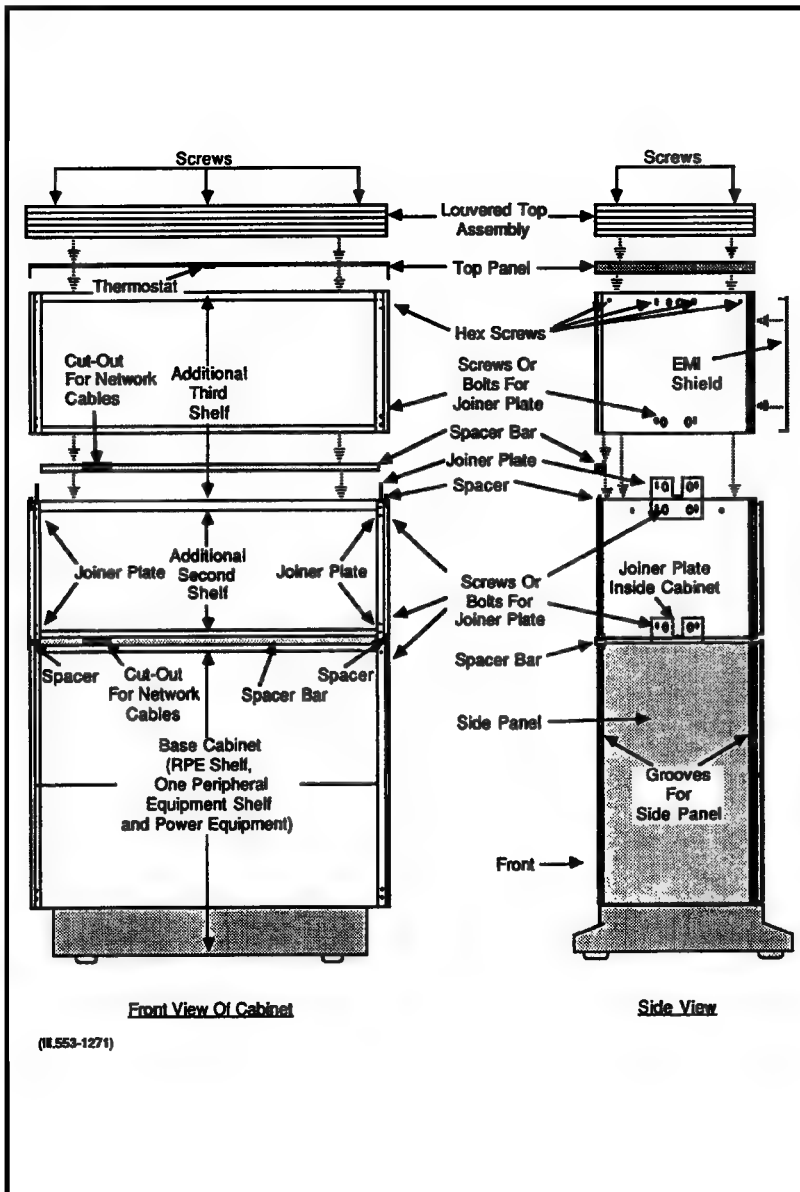


Figure 2-7
Rear View of Cabinet

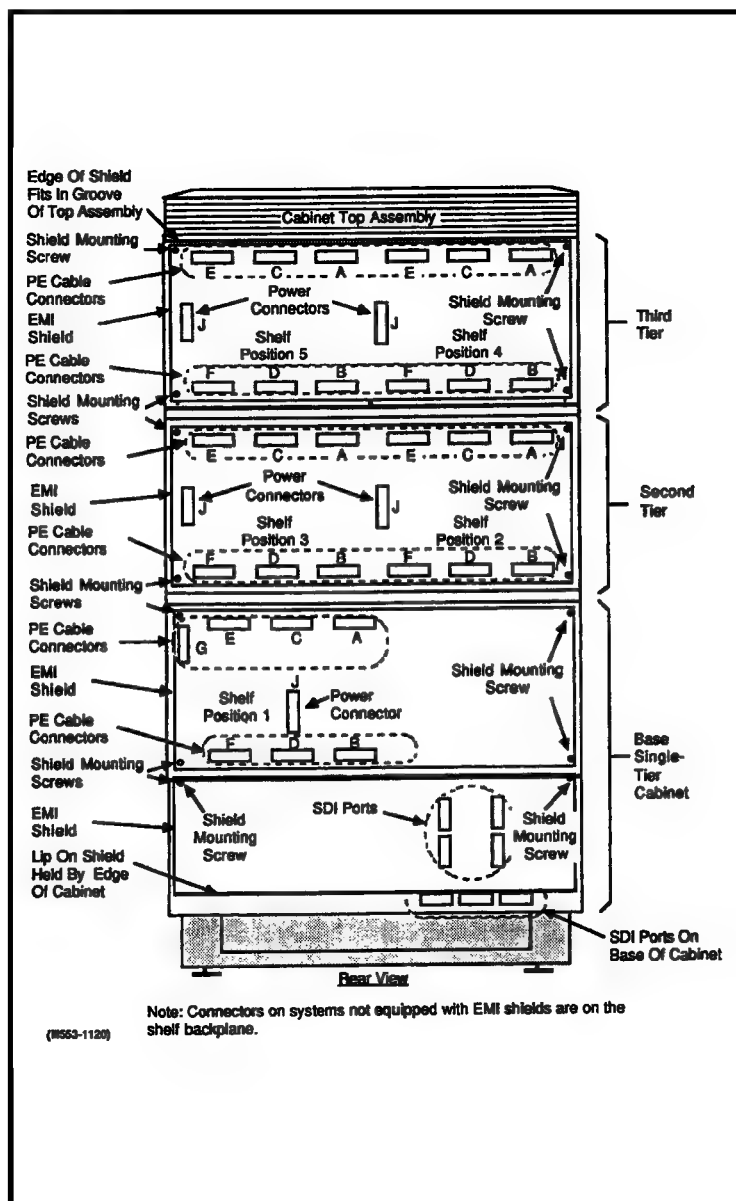


Chart 2-3**QBL24 BATTERY UNIT INSTALLATION (MAIN UNIT)**

When adding batteries to a cabinet ensure that the cabinet is connected to a 220 V 20A or 110 V 30A ac power supply. Service is interrupted when adding batteries to an operating cabinet.

Caution: *Do not add batteries to a cabinet connected to a 110 V 15A power supply. Ensure batteries are installed in a well ventilated area.*

STEP PROCEDURE

- 1 If more than one QBL24 battery unit is being connected to this cabinet, refer to Chart 2-4 and connect the expansion QBL24 unit.

Note: The expansion QBL24 unit requires a QCAD301 expansion cable.

- 2 Set the breaker on the front of the QBL24 unit to OFF.
- 3 Remove cover from the QBL24 unit by loosening the captive screws on top of the unit.
- 4 Unpack batteries and place in unit as shown in Fig. 2-8.
Ensure that the date indicated on the battery packs is the same on all packs.

WARNING: *The battery cells are capable of delivering high currents when externally short-circuited. Caution must be used when working near the open terminals of the batteries to ensure that the terminals are not inadvertently short-circuited.*

- 5 With the three black jumper wires supplied with the batteries, connect the four battery packs in series as shown in Fig. 2-8. Connect the large lug of the black to the large terminal (+) on the first battery pack. Connect the small lug of the wire to the small terminal (-) on the second battery pack and so on until all packs are interconnected. Ensure that connections to battery terminals are secure but do not over-tighten (maximum torque not to exceed 35 in/lb (3.95 N.m)).
- 6 Connect the black wire inside the battery unit to the remaining positive (+) battery terminal and the red wire to the remaining negative (-) battery terminal.
- 7 If not removed, remove the front and rear covers from the cabinet.
- 8 Service will be interrupted on operating cabinet when performing this step.

Set the AC BRKR breaker on the faceplate of the -48 V rectifier at the front of the cabinet to OFF.

Chart Continued

Chart 2-3 Continued

QBL24 BATTERY UNIT INSTALLATION (MAIN UNIT)

STEP PROCEDURE

- 9 If not previously disconnected, disconnect the power line cord from the commercial power supply.
- 10 Remove the EMI shield (if equipped) from the bottom rear of the cabinet.
- 11 Remove the lock nut from the 90° elbow on the end of the flexible conduit containing wiring from the QBL24 unit.
- 12 Insert the wires and the 90° elbow in the hole at the rear of the cabinet to the right of the cabinet power cord.
- 13 Insert the wires through the lock nut and secure elbow to cabinet.
- 14 At the rear of the -48 V rectifier, disconnect and remove red and black wires going from TB3 to TB1 at the rear of the QUX19 unit (Fig. 2-9).
- 15 Connect the power and control wiring from the QBL24 unit as follows (Fig. 2-9):
 - Connect the long black wires (designated 1 and 2) to terminals 1 and 2 of TB3 at the rear of the rectifier.
 - Remove straps from terminals 1 and 2, and 3 and 4 of TB4 at rear of rectifier (Fig. 2-9).
 - Connect the black wire equipped with a spade tip connector to terminal 2 (+SENSE) on TB4 of the rectifier (Fig. 2-9).
 - Connect the red wire equipped with a spade tip connector to terminal 3 (-SENSE) on TB4 of the rectifier (Fig. 2-9).
 - Connect red and black wires not equipped with connectors (bare-ended) to the R (1) and BK (2) terminals of TB1 at the rear of the QUX19 unit (Fig. 2-9).
 - Connect the white wire equipped with two spade tip connectors (designated DCON) to the terminal designated DCON (terminal 5) on TB4 at rear of rectifier. Connect the second connector on the wire to terminal 3 on TB2 at the rear of the QUX19 unit.
 - Connect the remaining green wire to the GRD1A lug on the ground bar at the rear of the cabinet.
- 16 Reinstall the EMI shield if previously removed.

Chart 2-3 Continued**QBL24 BATTERY UNIT INSTALLATION (MAIN UNIT)**

STEP	PROCEDURE
17	Install cover on QBL24 battery unit and secure with locking screws.
18	Set all breakers on the front of the QUX19 and QUX20 power distribution units to the OFF position.
19	Connect the power line cord to the commercial power supply.
20	Set the AC BRKR breaker on the front of the -48 V rectifier to ON.
21	With a volt meter, measure the voltage at the test points located on the front of the QBL24 battery unit (Fig. 2-10). If required, adjust the voltage by turning the VOLT ADJ screw on the rectifier until a reading of -53.60 V is attained.
22	Set breakers to ON in the following order: - DC BRKR breaker on the front of the QBL24 unit (and expansion unit if equipped). - CAB INP breaker on the QUX19 unit.
Note: Check power and battery connections if DC BRKR or CAB INP breaker trips. - CE/PE1 breaker on QUX19 unit. - PE2 through PE5 breakers on QUX20 unit (if equipped).	
Note: Breakers PE2 through PE5 supply power to the corresponding shelf positions in the cabinet. Breakers for unused positions should be set to OFF.	
23	If required, install cabinet covers.

Chart 2-4

EXPANSION QBL-24 BATTERY UNIT INSTALLATION

STEP	PROCEDURE
1	Set the breaker on the front of the QBL24 unit to OFF.
2	Remove cover from the QBL24 unit by loosening the captive screws on top of the unit.
3	Unpack batteries and place in unit as shown in Fig. 2-8. Ensure that the date indicated on the battery packs is the same on all packs.
WARNING: <i>The battery cells are capable of delivering high currents when externally short-circuited. Caution must be used when working near the open terminals of the batteries to ensure that the terminals are not inadvertently short-circuited.</i>	
4	With the three black jumper wires supplied with the batteries, connect the four battery packs in series as shown in Fig. 2-8. Connect the large lug of the black to the large terminal (+) on the first battery pack. Connect the small lug of the wire to the small terminal (-) on the second battery pack and so on until all packs are interconnected. Ensure that connections to the battery terminals are secure but do not over-tighten (maximum torque not to exceed 35 in/lb (3.95 N.m.)).
5	Connect the black wire inside the battery unit to the remaining positive (+) battery terminal and the red wire to the remaining negative (-) battery terminal.
6	If the expansion QBL24 battery unit is being added to a main QBL24 unit previously connected to an operating cabinet, remove the front covers from the cabinet. Set the following breakers to OFF: • the AC BRKR breaker on front of -48 V rectifier • the DC BRKR on front of main QBL24 battery unit. • the CAB INP breaker on the QUX19 unit.
7	Remove cover from top of the main QBL24 battery unit.
8	Remove plug from top hole on the right side of the main QBL24 battery unit (Fig. 2-10).
9	Remove lock nut from the 90° elbow on the end of the flexible conduit containing wiring from the expansion QBL24 unit.
10	Insert the wires and the 90° elbow in the top hole on the right of the existing QBL24 battery unit (Fig. 2-10).

Chart 2-4 Continued**EXPANSION QBL-24 BATTERY UNIT INSTALLATION****STEP PROCEDURE**

- 11 Insert the wires through the lock nut and secure elbow to cabinet.
- 12 Connect wiring from expansion QBL24 battery unit to the main QBL24 unit as follows (Fig. 2-10).
 - Connect the green to lug 2 at the front of the unit.
 - Connect the black wire to terminal 1 of terminal strip W1.
 - Connect the red wire to terminal 5 of TB1.
- 13 Install covers on both QBL24 battery units.

Note: Do not install cover on main QBL24 if battery cells have not been installed in that unit.

- 14 Perform this step only if the expansion QBL24 battery unit is added to a main QBL24 unit previously connected to an operating cabinet.
 - a) Set the AC BRKR breaker on the -48 V rectifier to ON.
 - b) Set the AC BRKR breaker on the main QBL24 battery unit to ON.
 - c) Set the AC BRKR breaker on the expansion QBL24 battery unit to ON.

Note: Check wiring and polarity of batteries if DC BRKR breaker on the QBL24 battery unit trips.

 - d) Set the CAB INP breaker on the QUX19 unit to ON.
- 15 If required, install cabinet covers.

Figure 2-8
Battery Cell Connections

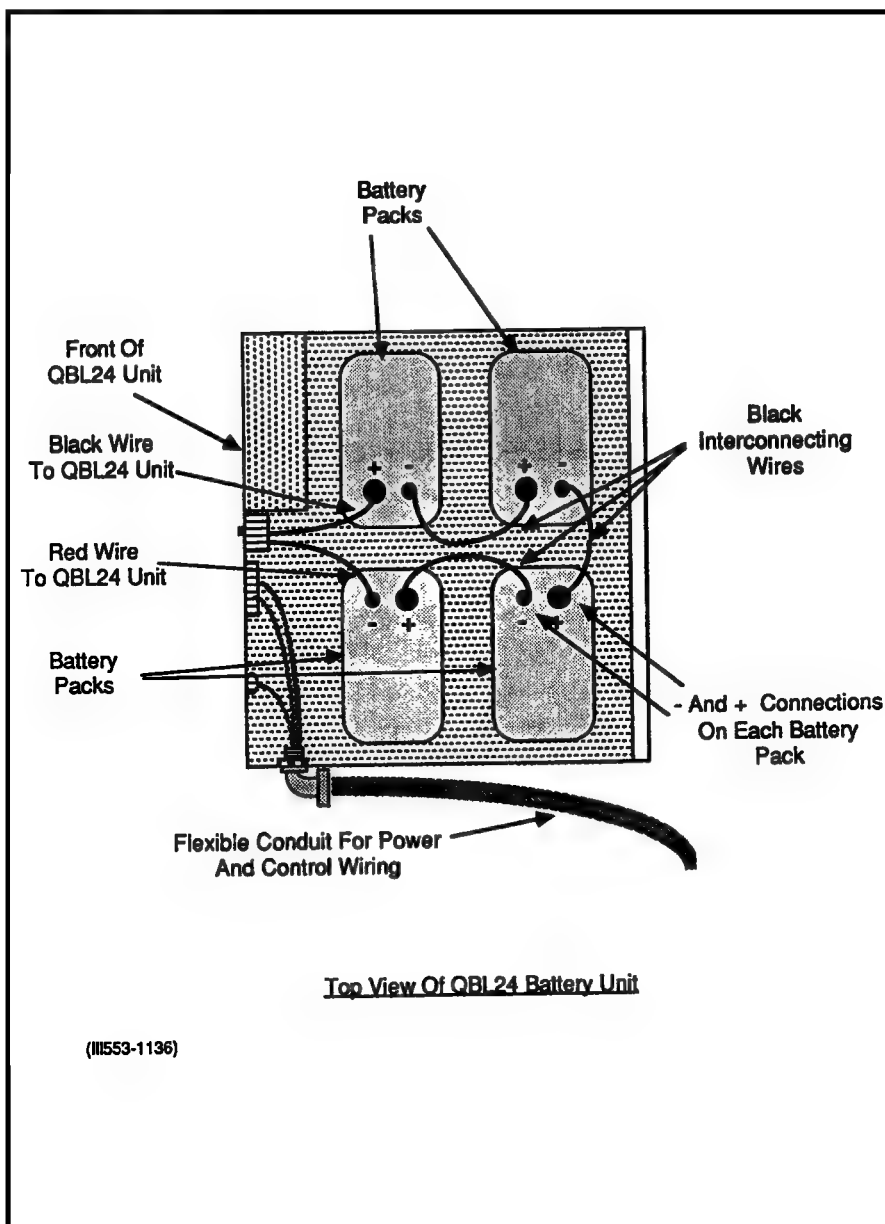


Figure 2-9
Reserve Power Supply Connections

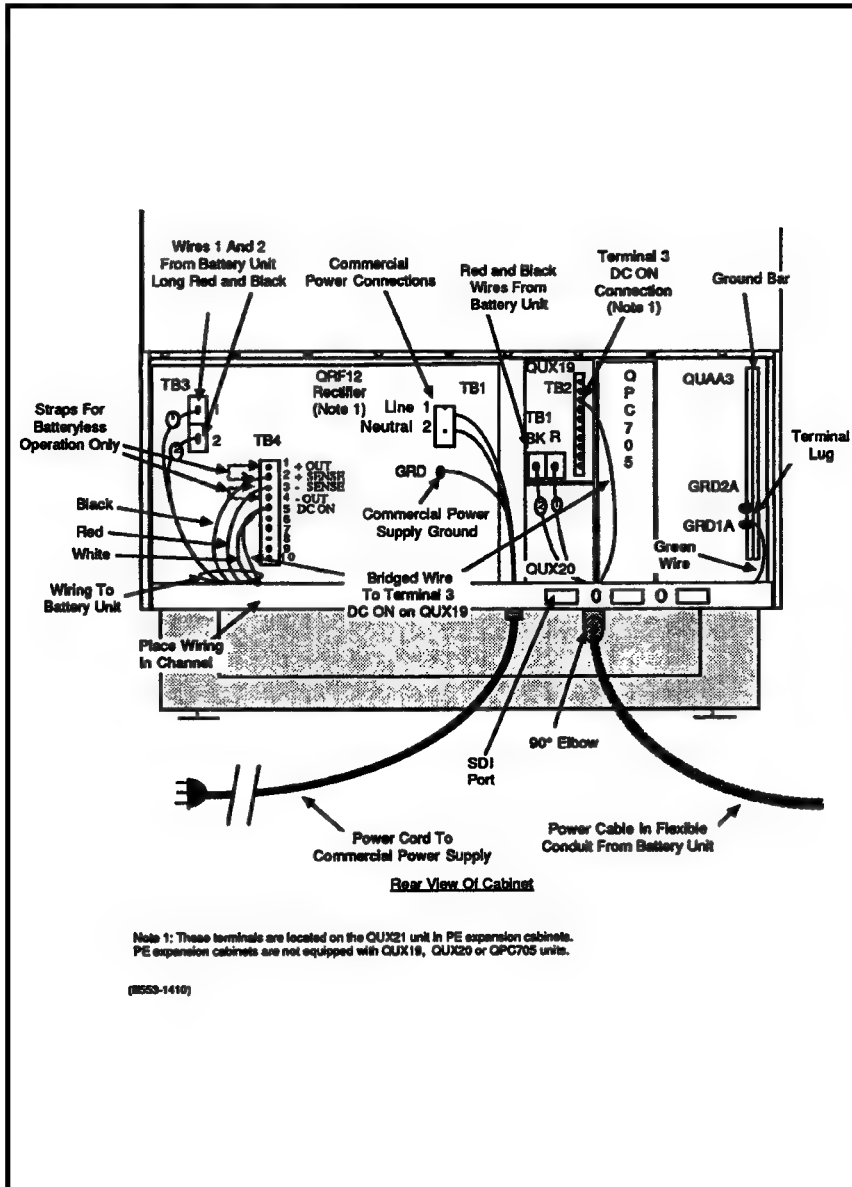
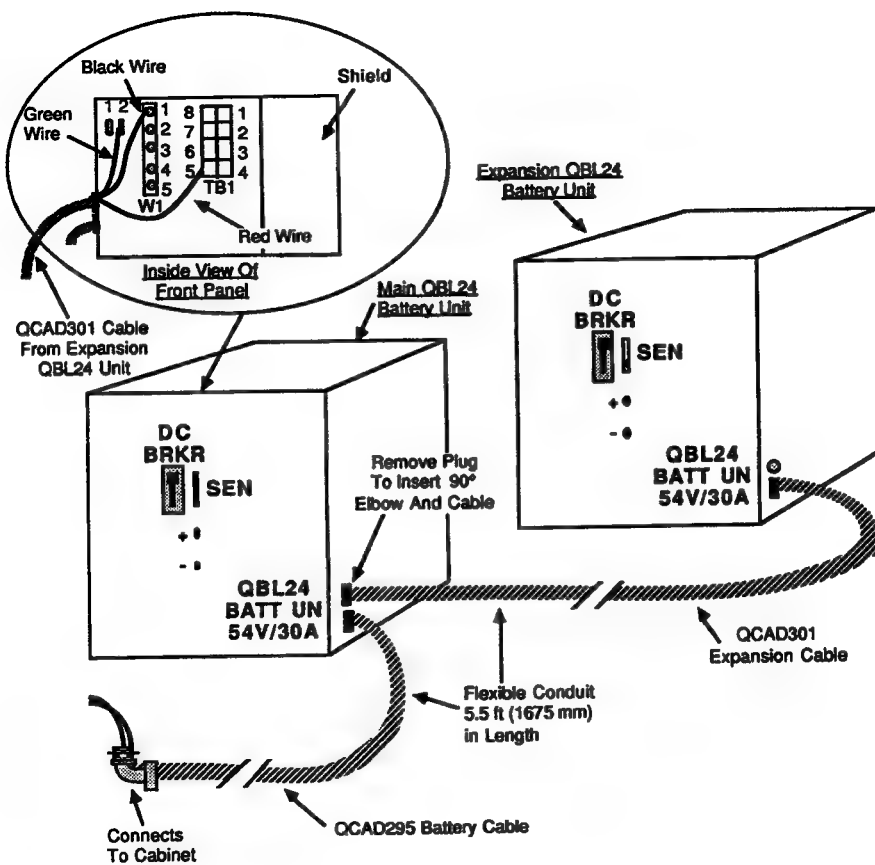


Figure 2-10
Expansion Battery Unit Connections



(#553-1138)

Chart 2-5**QUA6 POWER FAIL TRANSFER UNIT (PFTU) INSTALLATION**

The QUA6 unit is located on the bottom rear EMI shield in cabinets equipped with a built-in cross connect terminal (Fig. 2-3) and is accessible by removing the rear cabinet cover.

STEP PROCEDURE

- 1 Remove the QUA6 unit from its container.
 - 2 Mount the unit (preferably on a wall if cabinet is not equipped with a built-in cross connect terminal) near the Meridian SL-1 cross connect terminal and secure with four screws.
 - 3 Install an NE-A25B-type cable from connector J1 on the QUA6 unit to a connecting block reserved for PFJ1 cables at the cross-connect terminal.
 - 4 Cross-connect the PFJ1 cable to the P10 cable and to the telephones and trunks assigned to emergency transfer. See Table 2-B.
-

Chart 2-6

ALARM AND TRANSFER WIRING (P10) INSTALLATION

P10 wiring in cabinets equipped with a built-in cross connect terminal is terminated on the lower right set of blocks mounted on the rear of the cabinet. This chart describes the method of extending the P10 wiring to an external cross connect terminal. Connections and designations for the P10 wiring are the same in both instances.

The P10 wiring is extended from the rear of the QUX19 unit in the cabinet to the cross connect terminal using a QCAD294-type cable available in the following lengths:

- 25 ft (7600mm) – QCAD294B1
- 50 ft (15200 mm) – QCAD294B2
- 100 ft (30400 mm) – QCAD294B3

One QCAD294 cable is required when the cabinet is served by one or more QUA6 Power Fail Transfer Units (PFTU). This cable should be designed as cable 1.

A second QCAD294 cable is used to extend the major (MJ) alarm connections to attendant consoles and to extend remote (REM) alarm connections. This cable should be designated as cable 2.

STEP PROCEDURE

- 1 If not previously removed, remove the lower rear cover and EMI shield (if equipped) from the cabinet.
- 2 Tag and install one or two (as required) QCAD294 cables through a round access hole at the rear of the cabinet.

Note: The end of the wires equipped with spade tip connectors will be connected to TB2 at the rear of the QUX19 power unit. Leave enough wire to reach the connections.
- 3 Install the cables in to the area reserved for P10 cables at the cross connect terminal.

Note: The cables each contain two black wires, one paired with a white wire and one with a red wire. Care must be taken not to interchange the black wires
- 4 Terminate and designate cable 1 (if provided) as follows (Fig. 2-11):
 - Terminate the red wire and designate as AUX.
 - Terminate the white wire and designate as GRD.

Chart Continued

Chart 2-6 Continued**ALARM AND TRANSFER WIRING (P10) INSTALLATION****STEP PROCEDURE**

- Terminate the black wire associated with the white wire and designate as XPE.
 - Terminate the black wire associated with the red wire and designate as CPE.
 - Store the braided wire (connected only in the cabinet to suppress EMI).
- 5 Terminate and designate cable 2 (if provided) at the cross connect terminal as follows (Fig. 2-11):
- Terminate the black wire associated with the red wire and designate as REM A.
 - Terminate the black wire associated with the white wire and designate as REM B.
 - Terminate the red wire and designate as MJ.
 - Store the remaining white wire (not used) and the braided wire (connected only in the cabinet to suppress EMI).
- 6 Connect cable 1 (if provided) to the terminals on TB2 at the rear of the QUX19 unit in the cabinet as follows:
- red wire to terminal 5 (AUX) on TB2.
 - white wire to terminal 4
 - black wire associated with the white wire to terminal 8 (XPE).
 - black wire associated with the red wire to terminal 9 (XCE).
 - braided bare wire to terminal 4.
- 7 Connect cable 2 (if provided) to terminals on TB2 at the rear of the QUX19 unit as follows:
- black wire associated with the red wire to terminal 6 (REMA).
 - black wire associated with the white wire to terminal 7 (REMB).
 - red wire to terminal 10 (MJ).
 - braided bare wire to terminal 4.
 - store the white wire (not used).
- 8 If required, reinstall EMI shield and cabinet cover.

Table 2-B

PFJ1 Emergency Transfer Cable Cross-Connections

FUNCTION	PAIR NUMBER	PAIR COLOR	CONNECTS TO	COMMENTS
C O N T R O L	1T 1R	W-BL BL-W	ALARM CONSOLE ALARM LED (GND) ON P10, CONSOLE	See 553-2201-215 for connections to attendant console.
	2T 2R	W-O O-W	(SLT) SHELF TRANSFER (APPEXIDE) (GND) ON P10	The Shelf Transfer (W-O) connects to pair 24R (BR-V) of cable C from each PE shelf in positions 2 to 5 and to XCE/XCE on the P10 cable served by this PFJ1.
	3T 3R	W-G O-W	(TQ) CONSOLE TRANSFER SWITCH	See 553-2201-215 for connections to attendant console.
	4T 4R	W-BR BR-W		This pair is not used.
	5T 5R	W-S S-W	800-TYPE TELEPHONE	Connect to 800-type telephone.
P F T 1	6T 6R	R-BL BL-R	800-LINE CARD	Connect to TN assigned to telephone.
	7T 7R	R-O O-R	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
	8T 8R	R-G G-R	CO LINE CARD	Connect to TN assigned to CO trunk.
P F T 2	9T 9R	R-BR BR-R	800-TYPE TELEPHONE	Connect to 800-type telephone.
	10T 10R	R-S S-R	800-LINE CARD	Connect to TN assigned to telephone.
	11T 11R	R-BL BL-R	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
	12T 12R	R-G G-R	CO LINE CARD	Connect to TN assigned to CO trunk.
P F T 3	13T 13R	R-G G-R	800-TYPE TELEPHONE	Connect to 800-type telephone.
	14T 14R	R-BR BR-R	800-LINE CARD	Connect to TN assigned to telephone.
	15T 15R	R-S S-R	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
	16T 16R	R-BL BL-R	CO LINE CARD	Connect to TN assigned to CO trunk.
P F T 4	17T 17R	R-O O-R	800-TYPE TELEPHONE	Connect to 800-type telephone.
	18T 18R	R-G G-R	800-LINE CARD	Connect to TN assigned to telephone.
	19T 19R	R-BR BR-R	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
	20T 20R	R-S S-R	CO LINE CARD	Connect to TN assigned to CO trunk.
P F T 5	21T 21R	R-BL BL-R	800-TYPE TELEPHONE	Connect to 800-type telephone.
	22T 22R	R-O O-R	800-LINE CARD	Connect to TN assigned to telephone.
	23T 23R	R-G G-R	CENTRAL OFFICE TRUNK	Connect to Central Office trunk.
	24T 24R	R-BR BR-R	CO LINE CARD	Connect to TN assigned to CO trunk.
PFJ1 POWER	25T 25R	V-S S-V	-52V -52V	Connect to ALUX on P10 cable

(R553-1145)

Fig. 2-11
P10 Cable Terminations and Designations

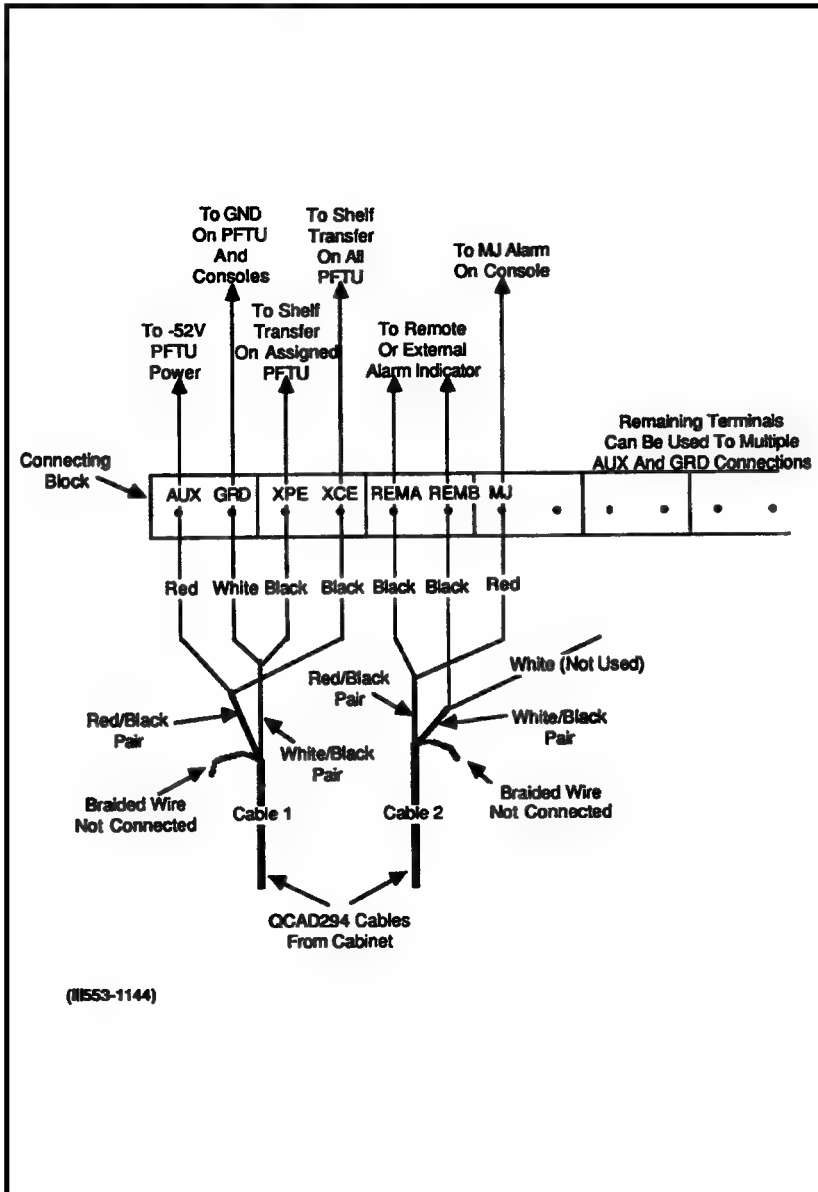


Chart 2-7

QPC705 POWER CONVERTER INSTALLATION

The QPC705 power converter mounts in the slot between the QUAA3 power unit and the QUX19 power distribution unit. A QCAD278 cable is required to connect the QPC705 power converter.

STEP PROCEDURE

- 1 Remove the lower front and rear cabinet panels.
 - 2 Remove the lower EMI shield (if equipped) from the rear of the cabinet.
 - 3 From the front of the cabinet, remove dummy faceplate covering the slot between the QUAA3 power unit and the QUX19 power distribution unit.
 - 4 Unpack the QPC705 power converter.
 - 5 Connect connector 705 on the QCAD278 cable to the connector on rear of QPC705 power converter.
 - 6 From the front of the cabinet, route the free end of the QCAD278 cable through the slot between the QUAA3 unit and the QUX19 unit to the rear of cabinet.
 - 7 Insert the QPC705 power converter in its assigned slot and secure to cabinet with mounting screws.
 - 8 ***Caution: Service in the cabinet is interrupted when performing this step.***
Set the CAB INP breaker on the QUX19 unit to OFF.
 - 9 From the rear of the cabinet, connect connector P2 of the QCAD278 cable to connector P2 at the rear of the QUX19 unit.
 - 10 Connect the black lead (equipped with a spade connector) to terminal 2 of TB2 on the rear of the QUX19 unit.
 - 11 Connect the black lead (equipped with a ring connector) to the GRD2 terminal on the ground bus at the rear of the cabinet.
 - 12 Set the CAB INP breaker on the QUX19 unit to ON. Service should be restored to the cabinet.
-

- 13 Reinstall the EMI shield and cabinet cover (if required).

Chart 2-8

QUD24 FAN UNIT INSTALLATION

STEP PROCEDURE

- 1 If not previously removed, remove the lower front and top rear covers.
 - 2 Remove screws securing cabinet top assembly and remove assembly and louvers (Fig. 2-12).
 - 3 Position QUD24 cooling units in their assigned location on the cabinet top panel and secure with mounting screws (Fig. 2-13).
 - 4 Connect a QCAD302 power cable from connector P2 on the first QUD24 unit to connector P1 on the second QUD24 unit (Fig. 2-13).
 - 5 Connect the male connector of a QCAD303 power cable to connector P1 on the second QUD24 unit (Fig. 2-12).
 - 6 Connect the other end of the QCAD303 power cable to connector CU1 of the QCAD277 power cable at the rear of the cabinet (Fig. 2-13).
 - 7 Install a QCAD304 terminating plug in connector P2 on the first QUD24 cooling unit (Fig. 2-13).
 - 8 Secure cooling unit cables to cabinet top panel with plastic cable ties to avoid interference with fans.
 - 9 Remove and store the six screws from the cabinet top assembly and insert six replacement screws (longer screws supplied with cooling unit assemblies).
- Note:* The six removed screws should be retained for future use.
- 10 Install the two extra louvers supplied with the cooling unit assemblies and reinstall the cabinet top assembly (Fig. 2-12).
 - 11 Ensure that the QUX19 unit located at the front bottom of the cabinet is equipped with a 3 A fuse in the fuse position designated FN.
 - 12 If required, reinstall cabinet covers.

Figure 2-12
Cabinet Top Assembly

Figure 2-13
Cooling Unit Location and Connections

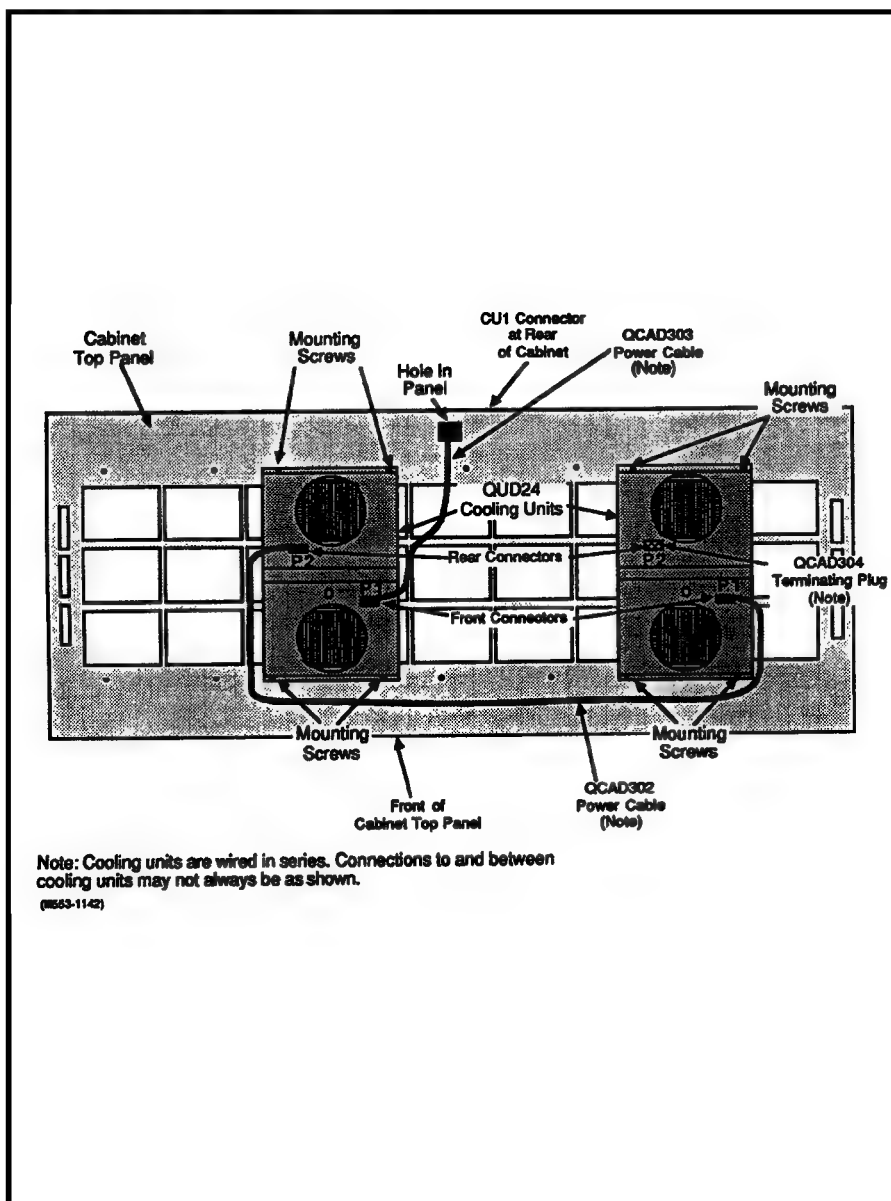


Chart 2-9**QCAD321 JUNCTION BOX ASSEMBLY INSTALLATION**

The QCAD321 junction box assembly is equipped with power and control wiring enclosed in a flexible conduit 5.5 ft (1675 mm) long. The junction box should be installed on the floor or on the wall within 5 ft (1525 mm) of the cabinet.

When suppression of Electromagnetic Interference (EMI) is a requirement, wiring should be run in metallic conduit between the QBL15 battery distribution box and the QCAD321 junction box assembly. The QBL15 battery distribution unit and the junction box are capable of accepting 1 $\frac{1}{4}$ in conduit.

STEP PROCEDURE

The QBL15 battery distribution units should be installed before attempting to install the QCAD321 junction box assembly.

- 1 Unpack the QCAD321 junction box assembly and dispose of the packing material.
- 2 Mount the junction box on a wall or locate on floor within 5 ft (1525 mm) of the cabinet.
- 3 Remove screws securing cover to function box and remove cover.
- 4 Remove front and rear covers from cabinet.
- 5 Service in the cabinet will be interrupted when performing this step on an operating cabinet.

Set the AC BRKR breaker on the faceplate of the -48 V rectifier in the cabinet to OFF.

Set breakers on the faceplates of the power distribution units (QUX19, QUX20, QUX21) to OFF.

- 6 If not previously disconnected, disconnect the power line cord from the commercial power supply.
- 7 Remove the EMI shield (if equipped) from the bottom rear of the cabinet.
- 8 If the first SDI port is equipped with a connector (Fig. 2-9), remove port mounting screws and pull SDI connector away from cabinet.
- 9 Remove the lock nut from the 90° elbow on the end of the flexible conduit containing wiring from the QCAD321 junction box.
- 10 Insert the wires and the 90° elbow in the hole at the rear of the cabinet to the right of the cabinet power cord.

Chart Continued

Chart 2-9 Continued**QCAD321 JUNCTION BOX ASSEMBLY INSTALLATION****STEP PROCEDURE**

- 11 Insert the wires through the lock nut and secure the 90° elbow to the cabinet. Ensure that the locking teeth on the nut are facing downward against the cabinet metal.
- 12 If previously removed, reinstall the SDI port.
- 13 Disconnect and remove the red and black wires going from TB3 at the rear of the -48 V rectifier to TB1 at the rear of the QUX19 unit (Fig. 2-9) or QUX21 unit (whichever is equipped).
Note: Do not discard these wires as they are required if the batteries are removed at a future date.
- 14 Connect the power and control wiring from the QCAD321 junction box as follows (see Fig. 2-9):

Connect the long black and red wires (designated wires 1 and 2) equipped with ring lugs to terminals 1 and 2 of TB3 on the QRF12 rectifier.

Remove straps between +OUT and +SENSE and -OUT and -SENSE terminals of TB4 on the QRF12 rectifier.

Connect the black and red wires equipped with spade tip connectors to +SENSE (black wire to terminal 2) and -SENSE (red wire to terminal 3) terminals of TB4 on the QRF12 rectifier.

Connect the two black and red wires not equipped with connectors (bare-ended) to the R (1) and BK (2) terminals of TB1 at the rear of the QUX19 or QUX21 power unit (whichever is equipped). Ensure that the connections are secure.

Connect the white wire equipped with two spade tip connectors (designated DCON) to DCON connection of TB4 on the QRF12 rectifier and extend to terminal 3 of TB2 at the rear of the QUX19 or QUX21 power unit (whichever is equipped).

Connect the remaining green wire to the GRD 1A lug on the ground bar at the rear of the cabinet.
- 15 Remove assigned DISCHARGE fuse from the QBL15 battery distribution box (Fig. 2-14).
- 16 Install and connect a 4 AWG red wire between the CHARGE bus in the QBL15 and terminal 1 of terminal block TB1 in the QCAD321 junction box (Fig. 2-14 and 2-15).

Chart Continued

Chart 2-9 Continued**QCAD321 JUNCTION BOX ASSEMBLY INSTALLATION****STEP PROCEDURE**

Note: Use one 4 AWG wire for distances up to 100 ft (30m). Use two 4 AWG wires for distances of 100 to a maximum of 200 ft (20 to 60 m). Terminal 2 of terminal block TB1 in the junction box is reserved for a second 4 AWG wire.

- 17 Install and connect a 2 pair 24 AWG Z-type station wire between terminal blocks TB1 and TB2 (-SENSE, +SENSE and ALARM) in the QBL15 battery distribution unit and terminal 1 (-SENSE), terminal 2 (+SENSE) and terminal 3 (ALARM) of terminal block TB2 in the QCAD321 junction box (Fig. 2-16).

Note: The TRIP connection is not used with a QCAD321 junction box assembly.

- 18 Remove the assigned discharge fuses (Fig. 2-14) from the QBL15 battery distribution box.
- 19 Install and connect a 4 AWG red wire from the assigned discharge fuse in the QBL15 battery distribution box to terminal 3 of terminal block TB1 in the QCAD321 junction box (Fig. 2-14 and 2-15).

Note: Use one 4 AWG wire for distances up to 100 ft (30m). Use two 4 AWG red wires for distances of 100 to a maximum of 200 ft (30 to 60m). Terminal 4 of terminal block TB1 in the junction box is reserved for a second 4 AWG wire.
If the cabinet draws more than 30 A, install and connect additional 4 AWG wiring between discharge terminal 4 in the QBL15 battery distribution box and terminal 3 or 4 of terminal block TB1 in the QCAD321 junction box.

- 20 Install and connect a 4 AWG black wire from the positive (+VE) bus in the QBL15 battery distribution box to terminal 5 of terminal block TB1 in the QCAD321 junction box (Fig. 2-14 and 2-15).

Note: Use one 4 AWG wire for distances up to 100 ft (30m). Use two 4 AWG wires for distances of 100 to a maximum of 200 ft (30 to 60m). Terminal 6 of terminal block TB1 in the junction box is reserved for a second 4 AWG wire.

- 21 Ensure that all connections and conduit (if required) are secured. If conduit is not used, grommets should be installed in the entrance holes of the QCAD321 junction box to protect the wiring.
- 22 Install cover on QCAD321 junction box and secure with four screws.

Chart Continued

Chart 2-9 Continued

QCAD321 JUNCTION BOX ASSEMBLY INSTALLATION

STEP PROCEDURE

- 23 Insert the previously removed DISCHARGE fuse in the QBL15 battery distribution box (Fig. 2-14).
- 24 Connect the power line cord to the commercial ac power supply.
- 25 Set breakers to ON in the cabinet in the following order:
 - a) CAB INP breaker on the QUX19 or QUX21 power distribution unit (whichever is equipped).
 - b) CE/PE1 breaker on the QUX19 unit (if equipped).
 - c) Remaining PE breakers on the power distribution units (QUX20, QUX21).

Note: The numbers assigned to the PE breakers correspond to the shelf positions in the cabinet. Breakers for unused shelf positions should be set to OFF.

- 26 Connect the positive test probe of a volt meter to a ground source and test the following terminals:
 - a) Terminal 1 of terminal block TB3 on the QRF12 rectifier. The meter should indicate a minimum reading of 52.08 V.
 - b) Negative input (CHARGE) terminal in the QBL15 battery distribution box. The meter should indicate a minimum reading of 52.08 V.

Any voltage variations from the batteries should be investigated.
- 27 Reinstall the EMI shield (if previously removed).
- 28 Insert the discharge fuses in the QBL15 battery distribution box.
- 29 Set the AC BRKR breaker on the faceplate of the -48 V rectifier in the cabinet to ON.
- 30 If required, install cabinet covers.
- 31 Install and secure the front panel on the QBL15 battery distribution unit.
- 32 Ensure that the EQUALIZE switch on the front of the QBL15 battery distribution box is set to OFF for normal operation.

Note: When the EQUALIZE switch is set to ON, the RECT LED on the QUAA3 unit in the cabinet extinguishes giving an alarm indication.

Chart 2-10**QBL15 BATTERY DISTRIBUTION BOX INSTALLATION**

The QBL15 battery distribution box should be located on the wall near the Meridian SL-1 cabinet to readily enable viewing of meters and LED indicators on the front of the unit.

When suppression of Electromagnetic Interference (EMI) is a requirement, power and alarm wiring should be run in metallic conduit between the QBL15 battery distribution box and the QCAD321 junction box assembly. The battery unit and the junction box are capable of accepting 1 1/4 in. conduit

STEP PROCEDURE

- 1 Unpack the QBL15 battery distribution box and dispose of the packing material.

Caution: *The QBL15 battery distribution box weighs approximately 50 lbs (23 kg).*

- 2 Inspect the unit for damage, paying particular attention to the meters. Report any damage to supplier.
- 3 Using screws or bolts, mount the unit on a wall within 6 ft (1830 mm) of the batteries. The bottom of the unit should be approximately 4 ft (1220 mm) above the floor (Fig. 2-14).

Note: A wooden backboard may be required to support the unit on the wall.

- 4 Remove the screws securing the front panel of the battery distribution box.
- 5 Remove the main fuse (CRS200) from the QBL15 battery distribution box (Fig. 2-14).
- 6 Install and connect a red 1/0 AWG wire between the negative terminal of the battery string and the negative input (-VE BUS) in the QBL15 battery distribution box (Fig. 2-15).
- 7 Install and connect a black 1/0 AWG wire between the positive terminal of the battery string and the negative bus (±VE BUS) in the QBL15 battery distribution box (Fig. 2-15).
- 8 Insert the main fuse (CRS200) in the QBL15 battery distribution box (Fig. 2-14).
- 9 If required, install cover.

Figure 2-14
QBL15 Battery Distribution Box

QBL15

Figure 2-15
Reserve Power Connections Outside Cabinet

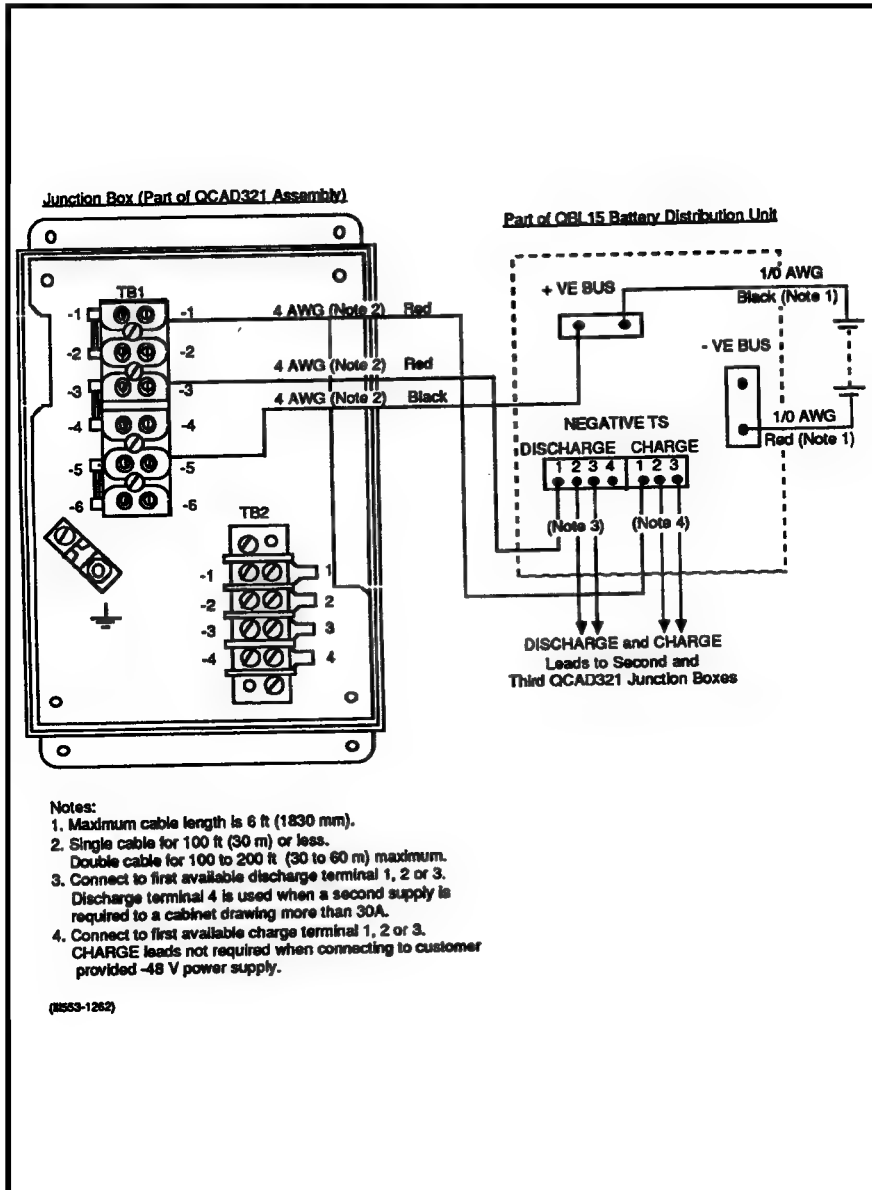


Figure 2-16
Battery Sensing and Monitoring Connections

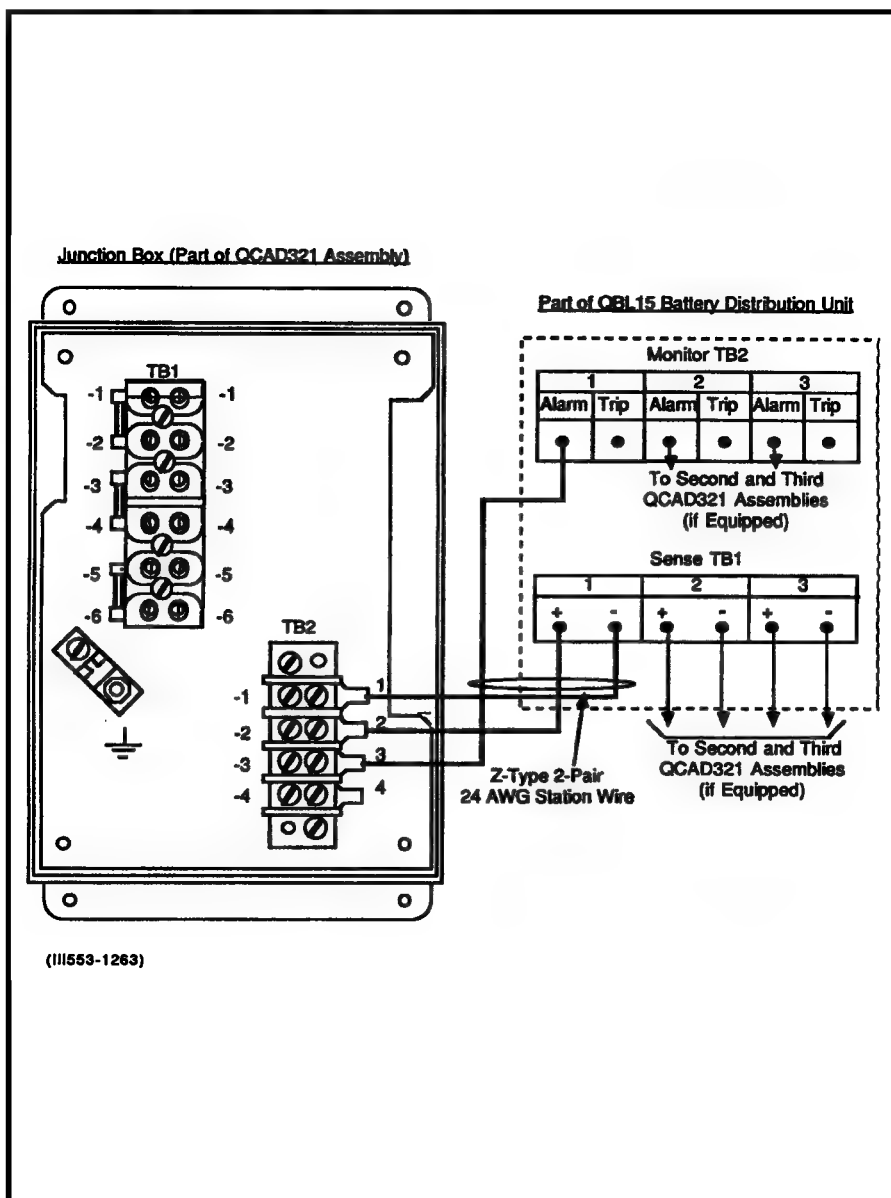


Figure 2-17
Local-To-Remote Cross-Connections

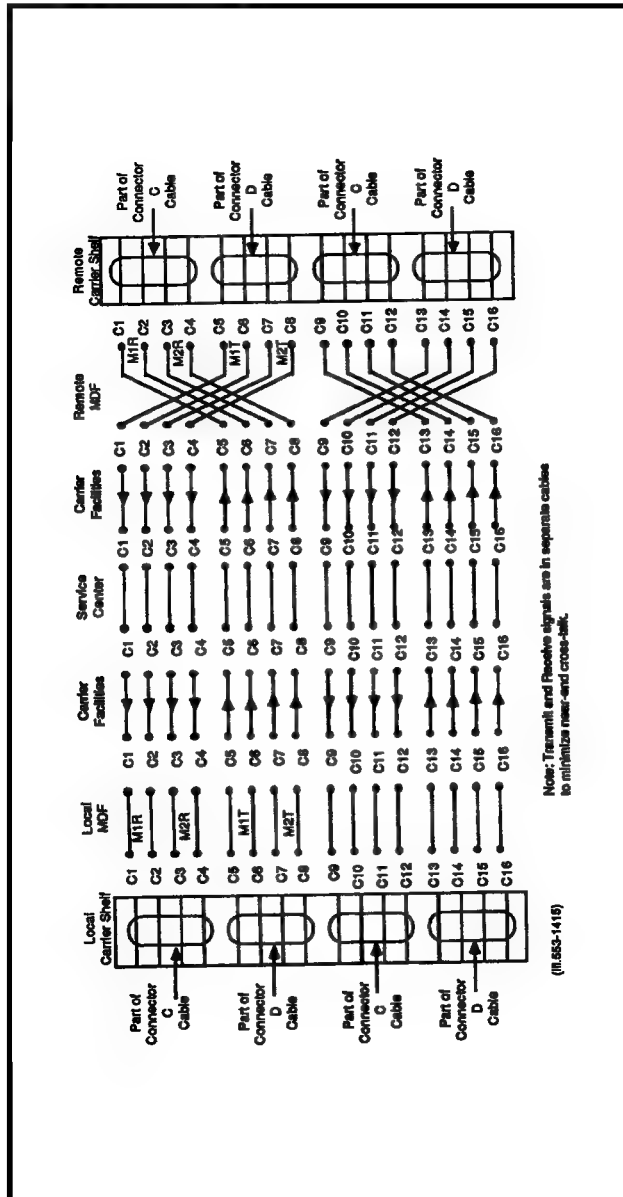


Table 2-C
Cable C Designations (Receive)
Local and Remote

Carrier	Network Loop	Card Position	Connector C Pin Number	Lead Color	Lead Designation
A	X	9	1	BL-W	C1
A	X	9	26	W-BL	C2
B	X	9	2	O-W	C3
B	X	9	27	W-O	C4
A	Y	9	3	G-W	C9
A	Y	9	28	W-G	C10
B	Y	9	4	BR-W	C11
B	Y	9	29	W-BR	C12
		9	5	S-W	OWT
		9	30	W-S	OWR
		9	6	BL-R	FLT
		9	31	R-BL	FLR
		4	7	O-R	FLWA
		4	32	R-O	FLWB
		4	8	G-R	WFIT
		4	33	R-G	WFIR
			9 to 25 (Note)		GND
			34 to 50 (Note)		GND

Note: These leads are grounded in the carrier shelf when cable connectors C and D are installed in jacks C and D. They are cut off at the MDF when cables C and D go directly to an MDF. Carrier problems are less likely to occur when cables terminate directly on the MDF. When cables C and D go to an intermediate cross-connect

terminal, such as a Meridian SL-1 cross-connect terminal, they are terminated at that terminal and extended to the MDF. These leads are then cut off at the MDF.

Table 2-D
Cable D Designations (Transmit)
Local and Remote

Carrier	Network Loop	Card Position	Connector D Pin Number	Lead Color	Lead Designation
A	X	9	1	BL-W	C5
A	X	9	26	W-BL	C6
B	X	9	2	O-W	C7
B	X	9	27	W-O	C8
A	Y	9	3	G-W	C13
A	Y	9	28	W-G	C14
B	Y	9	4	BR-W	C15
B	Y	9	29	W-BR	C16
		5	5	S-W	GND
		5	30	W-S	GND
		4	6	BL-R	PFX1
		4	31	R-BL	PFX2
		8	7	O-R	PFY1
		8	32	R-O	PFY2
		9	8	G-R	DCST
		9	33	R-G	DSCR
		9	9	BR-R	DETT
		9	34	R-BR	DETR
			10 to 25 (Note)		
			35 to 50 (Note)		

Note: These leads are grounded in the carrier shelf when cable connectors C and D are installed in jacks C and D. They are cut off at the MDF when cables C and D go

directly to an MDF. Carrier problems are less likely to occur when cables terminate directly on the MDF. When cables C and D go to an intermediate cross-connect terminal, such as a Meridian SL-1 cross-connect terminal, they are terminated at that terminal and extended to the MDF. These leads are then cut off at the MDF.

Integrated Services Network

Meridian SL-1*

QCA144 1.5 MB/S Remote Peripheral
Equipment Cabinet
Description, Installation and Testing

Copyright © 1987 Northern Telecom

All rights reserved.

Information subject to change without notice.

*Meridian and SL-1 are trademarks of Northern
Telecom Limited

Release 2.0

Standard

December 1, 1991

Printed in Canada

